TECHNOLOGY DEPT.

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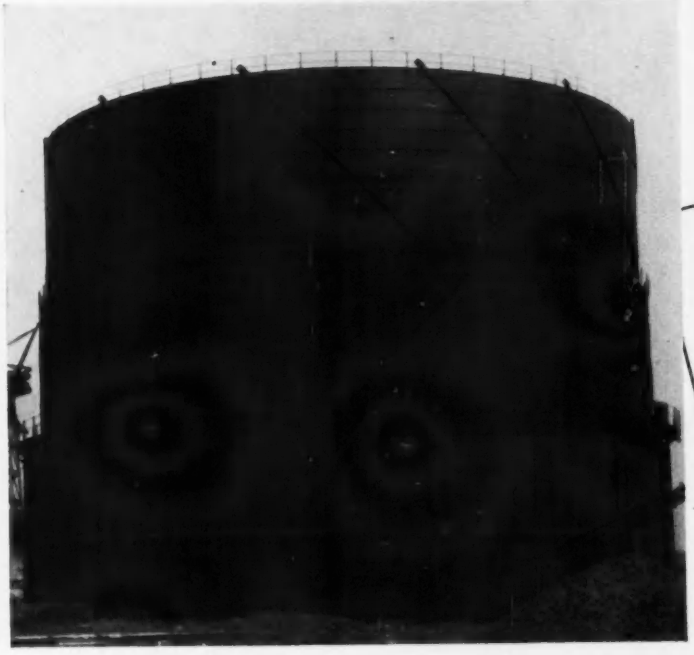
Gas Journal

VOL. 282. 107th YEAR. LONDON, APRIL 6, 1955 Nº 4792. PRICE 1/3

'IMUNOL' in the Scottish Steel Industry



Photograph by courtesy of
Bairds & Scottish Steel Ltd.
(Gartsherrie Works)

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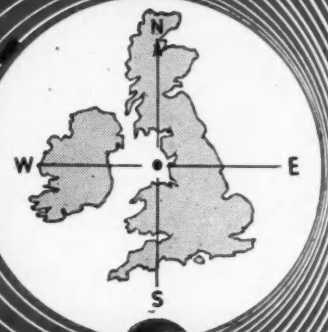

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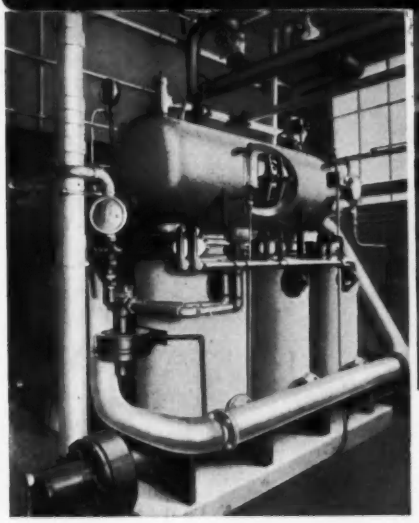

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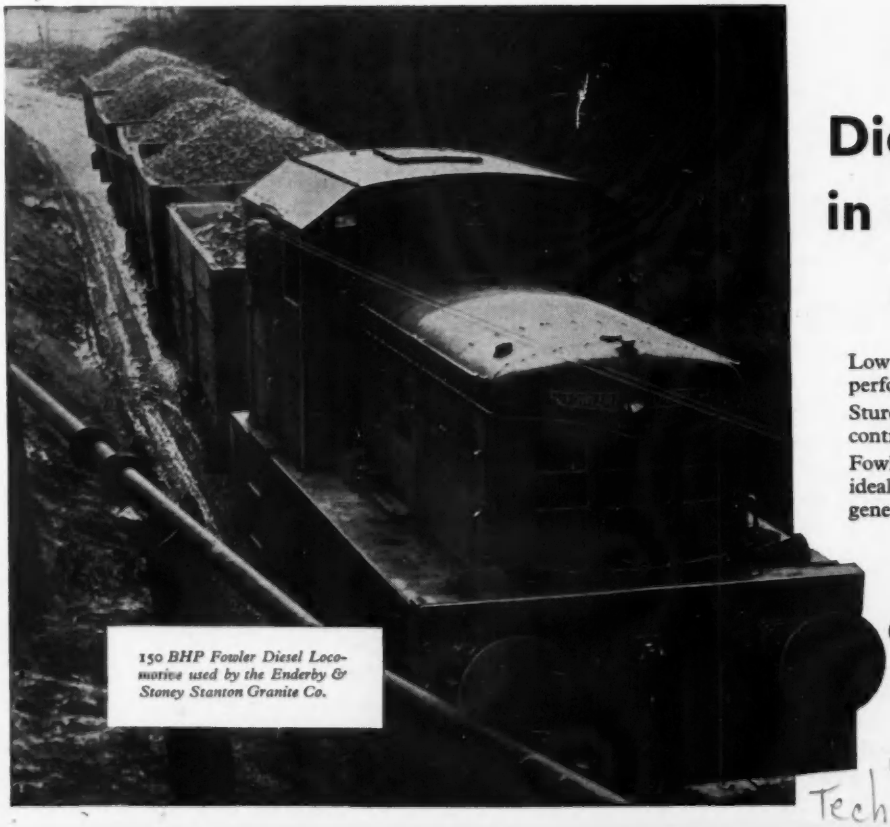

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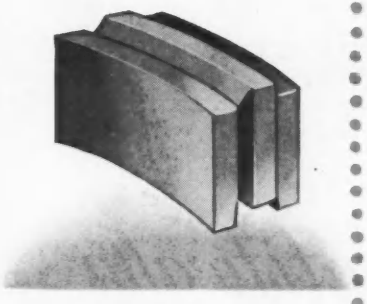

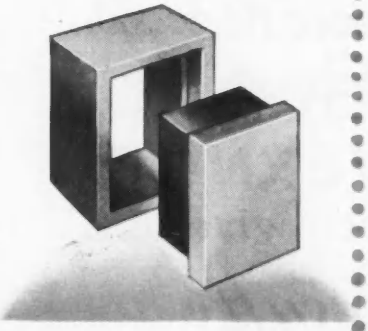

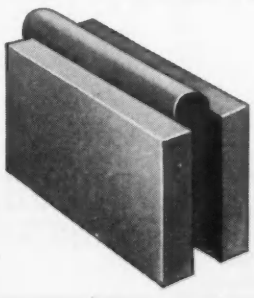

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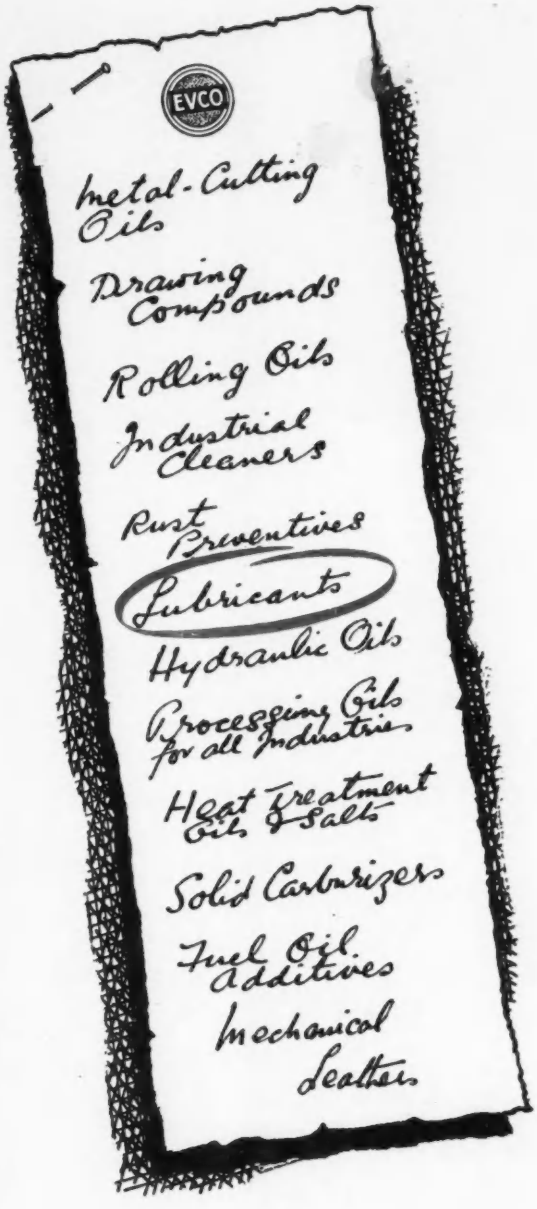

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We have long been associated with the development and supply of superior Lubricants and as a result of close collaboration, many machine builders exclusively recommend the use of our products.

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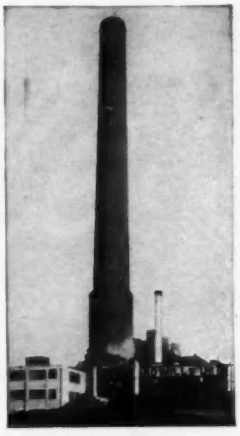
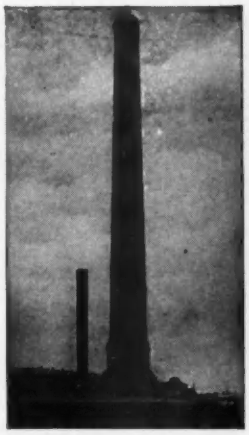
Left : Trial borings for reconstruction of Coventry Cathedral.





Two of the largest chimneys in the British Isles; on foundations of Francois Concrete Piles (left) and Francois Cementation Piles (Right)

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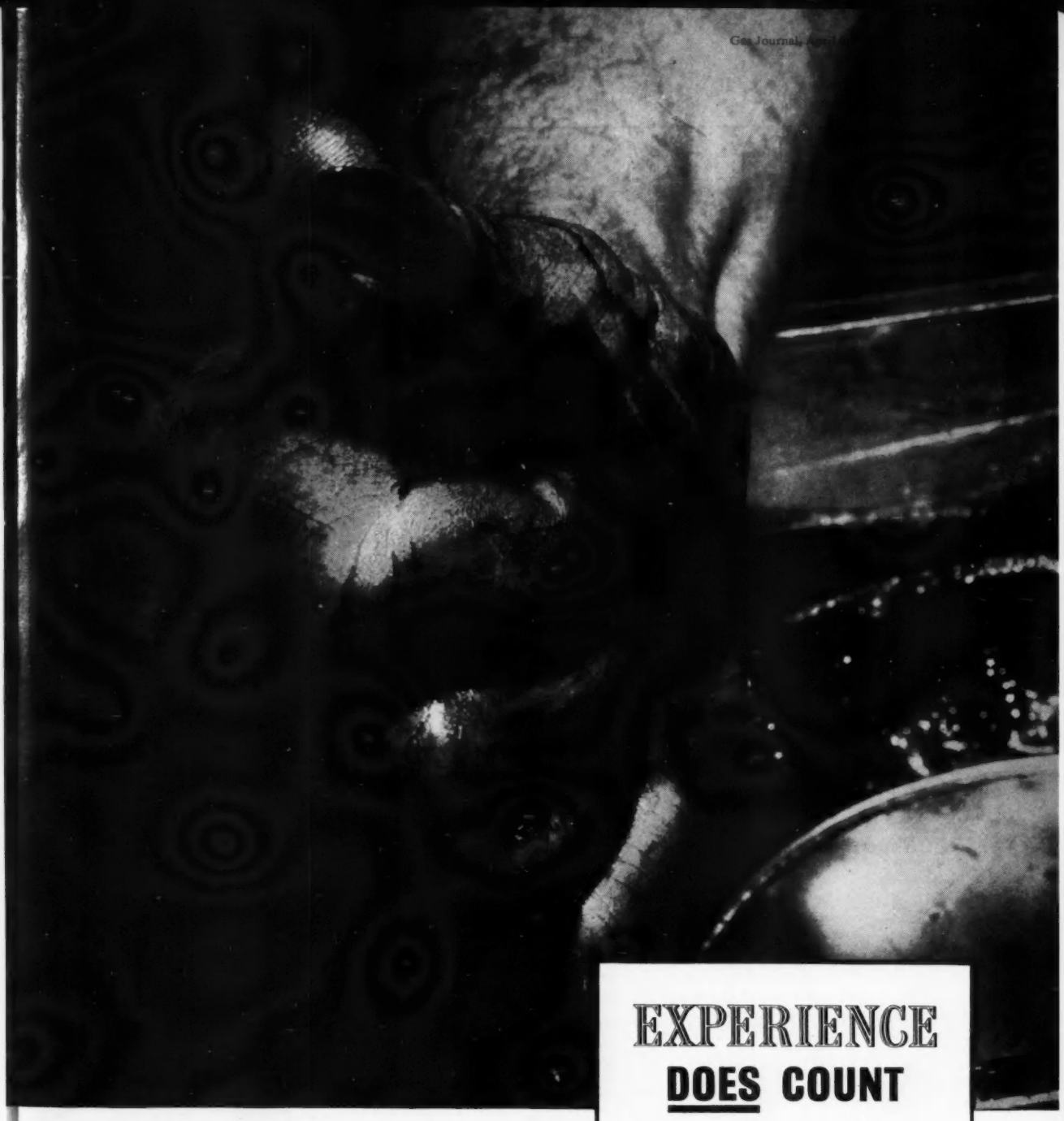

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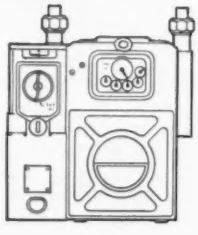

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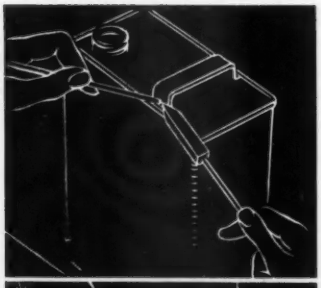
For all forms of tinplate and terneplate work. Its use speeds soldering, cuts cleaning time—and costs.



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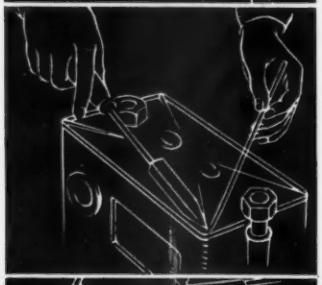

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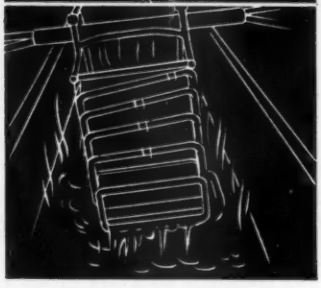

The Frysol range of fluxes by FRY'S *also includes several special fluxes for Stainless Steel, Zinc, etc. Please write for full details and samples.*

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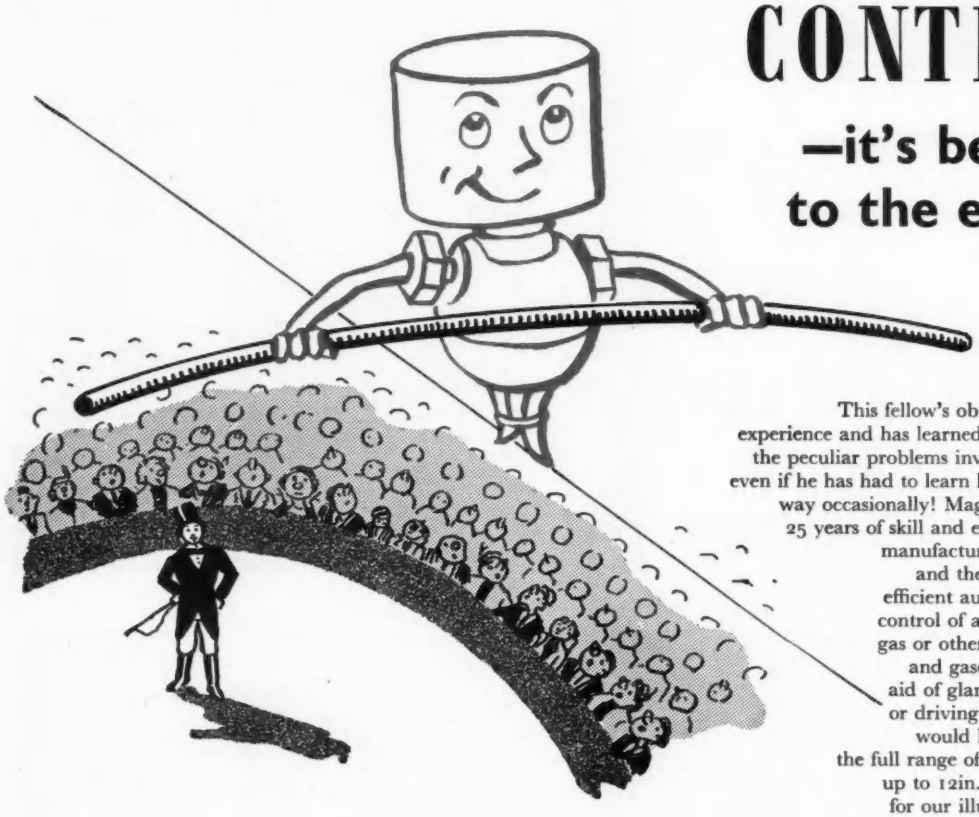
ON THE SUBJECT OF

CONTROL

—it's best left to the expert!



This fellow's obviously had lots of experience and has learned how to deal with the peculiar problems involved in his job—even if he has had to learn his lesson the hard way occasionally! Magnetic Valves have 25 years of skill and experience in valve manufacture built into them, and they supply the most efficient automatic or remote control of air, oil, steam, coal gas or other industrial liquids and gases. All without the aid of glands, stuffing-boxes, or driving-shafts, too. If you would like to learn about the full range of Magnetic Valves, up to 12in. orifice, please ask for our illustrated literature.

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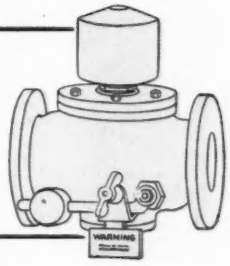
The installation of this valve is an essential precaution with all types of gas fired equipment and ensures complete isolation of the gas supply in the event of an interruption of the electrical supply WITHOUT automatic opening when such electrical supply is restored.



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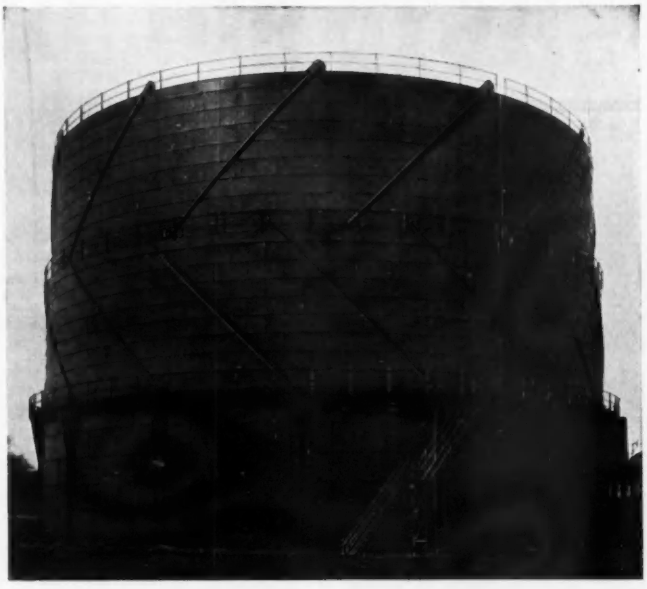

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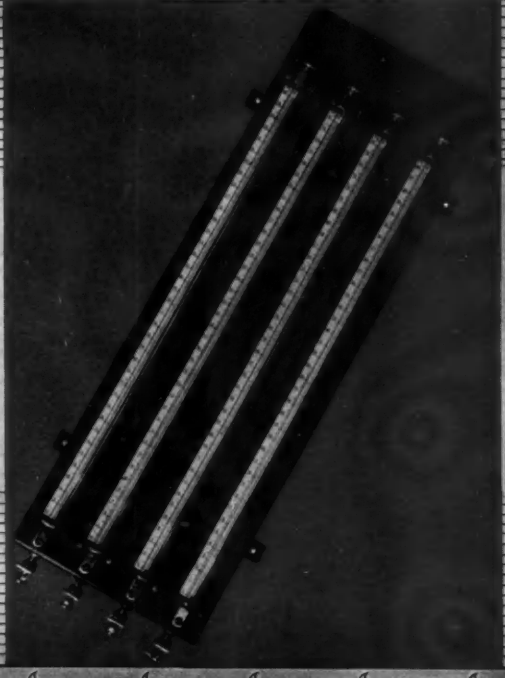

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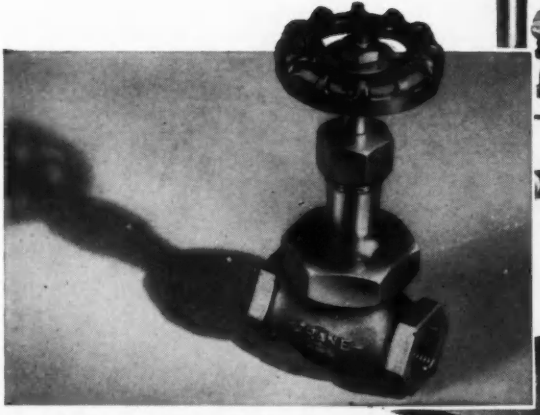

These Crane D.46 Gun Metal Globe Valves are fitted with a plug type disc of nickel alloy and a stainless steel seat ring, both parts being renewable. Screwed or flanged end connections available.

Photo of the boiler feed pump installation at the United Phosphate & Malt Co. Ltd.

CRANE VALVES AND FITTINGS

D17

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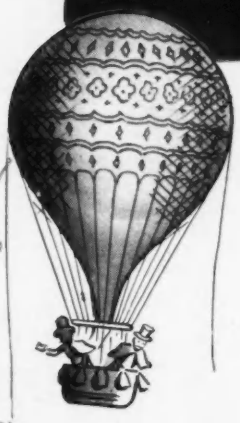

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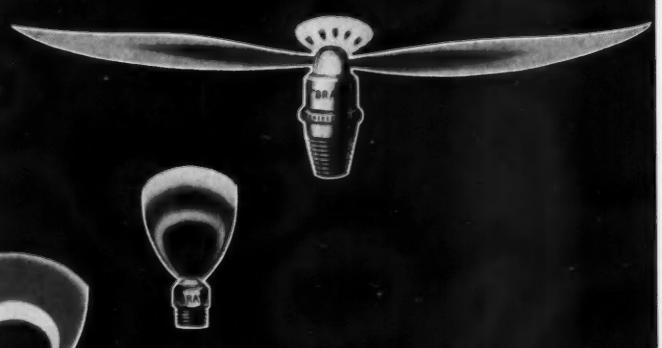

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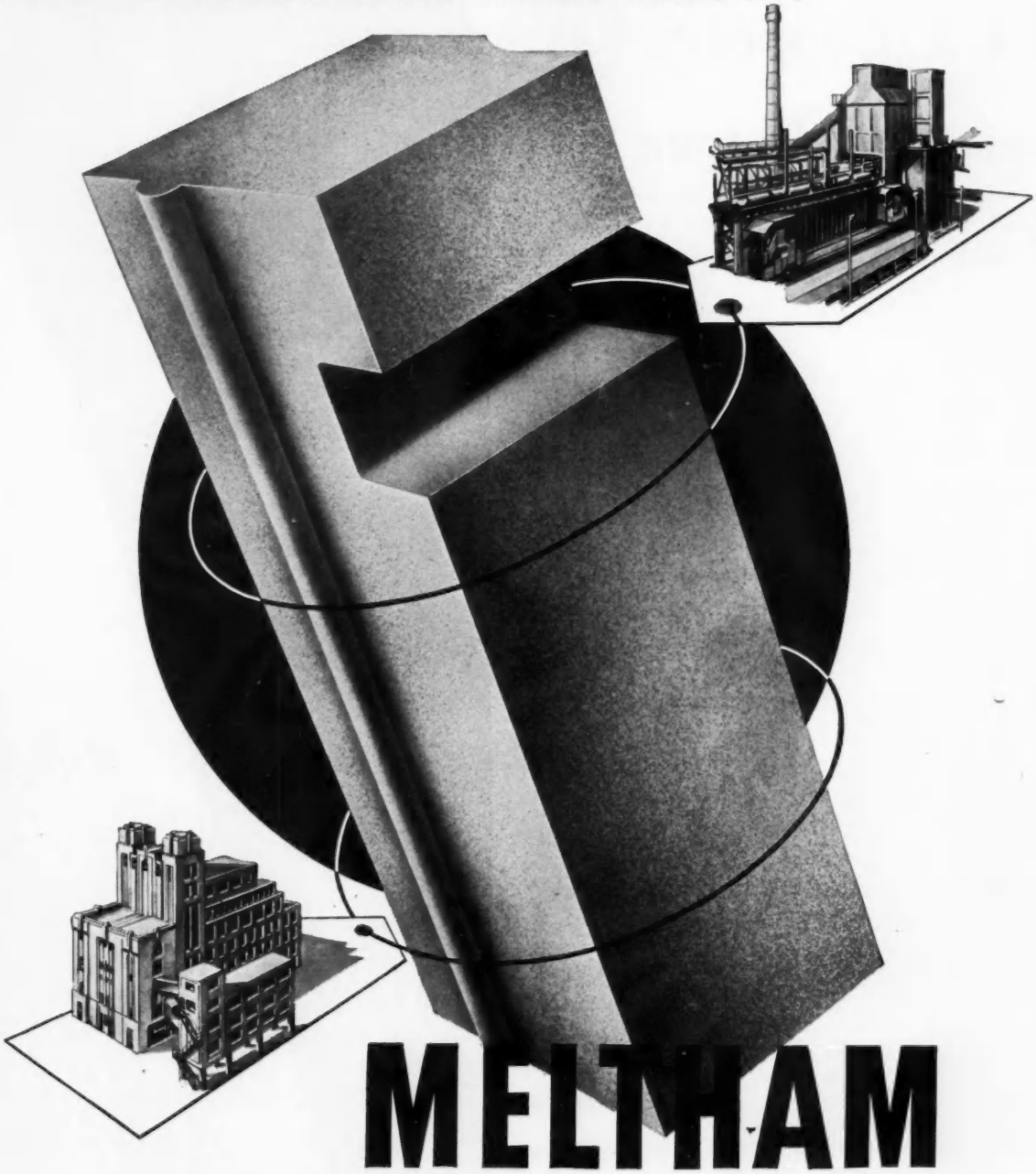

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104

I.C.I. Copper tubes for trouble-free Gas Systems

For domestic gas systems, light gauge copper tubes made by the Metals Division of I.C.I. have five obvious advantages. They are:—

1 **Economical, both in laying costs and maintenance.**

2 **Not attacked by normal town gas.**

3 **Easily manipulated and installed.**

4 **Strong in relation to their light weight.**

5 **Neat in appearance.**

Whatever the building—farmhouse or factory; house, hotel or hospital—the job is better done with I.C.I. copper tubes.

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ICI

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The reliability of Denso Anti-corrosion Products has been **proved** by their unfailing service to the Gas Industry for more than a quarter of a century. Throughout this period Denso Products have demonstrated their superiority over all other forms of corrosion-protection for mains and services (including the equally important protection of joints, couplings, ferrules, etc.) and their usefulness for effecting rapid and gas-proof temporary repairs.

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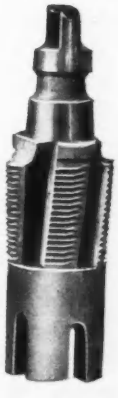

FIG. 16C1

it looks like an ordinary central action Cup Drill and Tap but it isn't.

If you have breakages you will be interested. The Cup Drill is our new pattern, it has several times the impact strength of ordinary Drills. Try it and prove it. The Tap is specially made for easy screwing.
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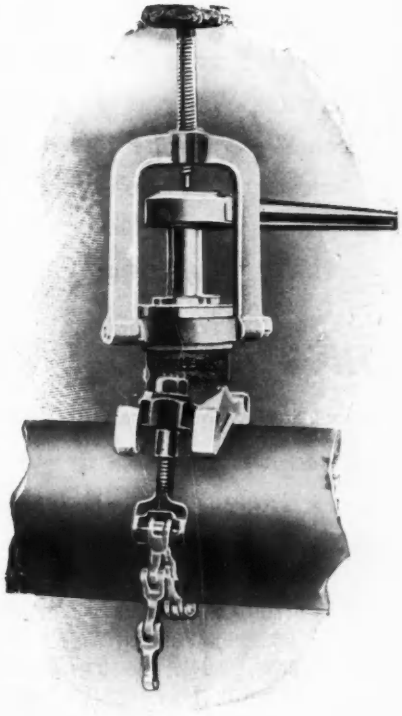

FIG. 18

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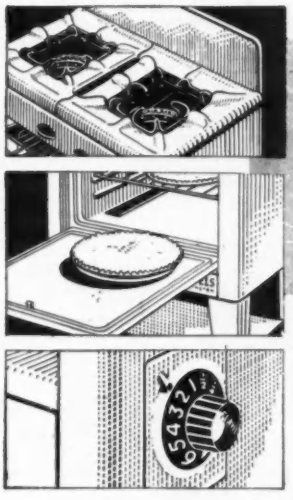

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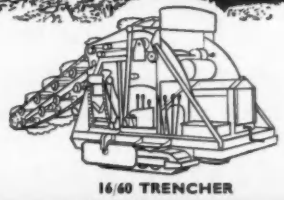

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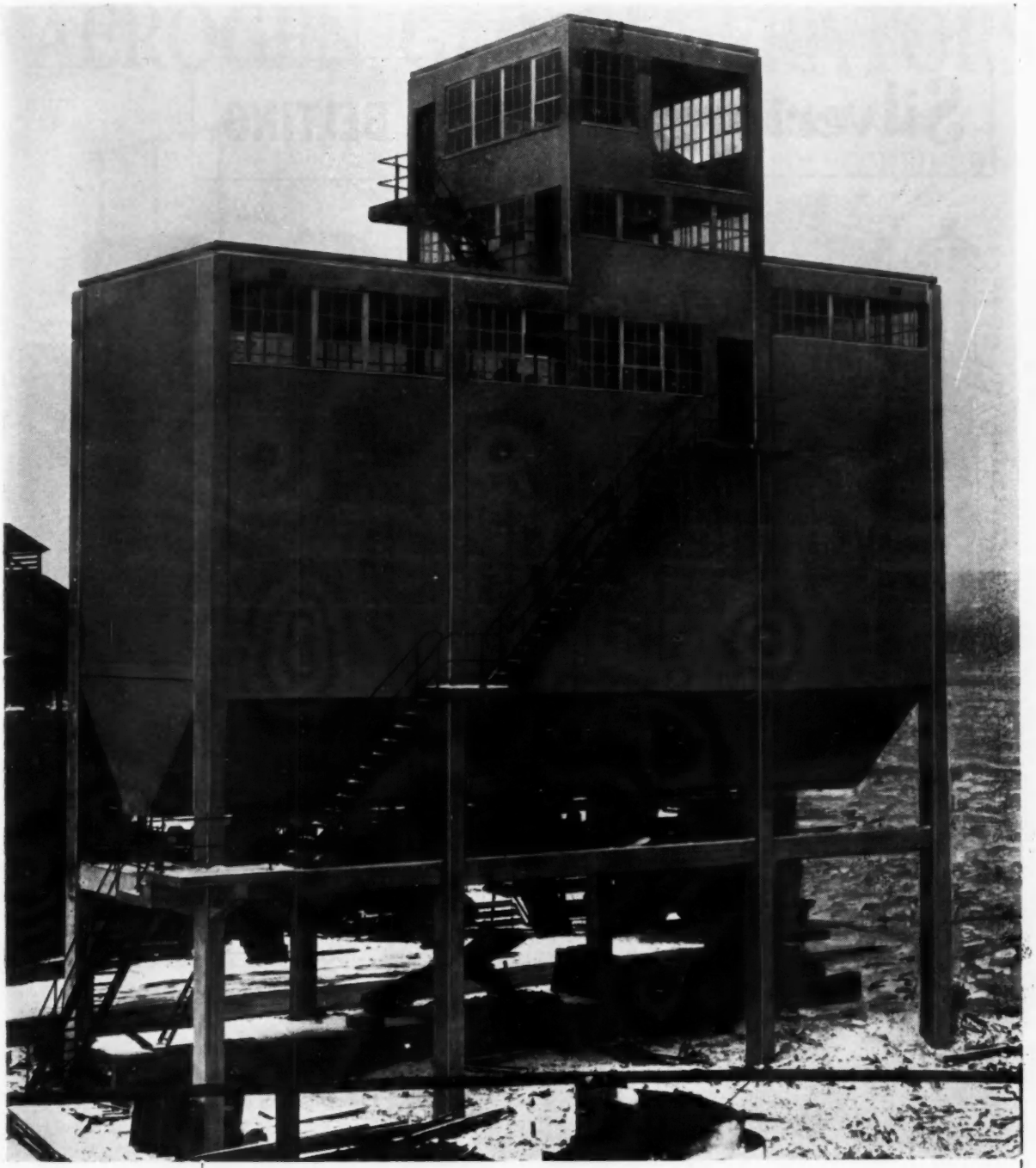

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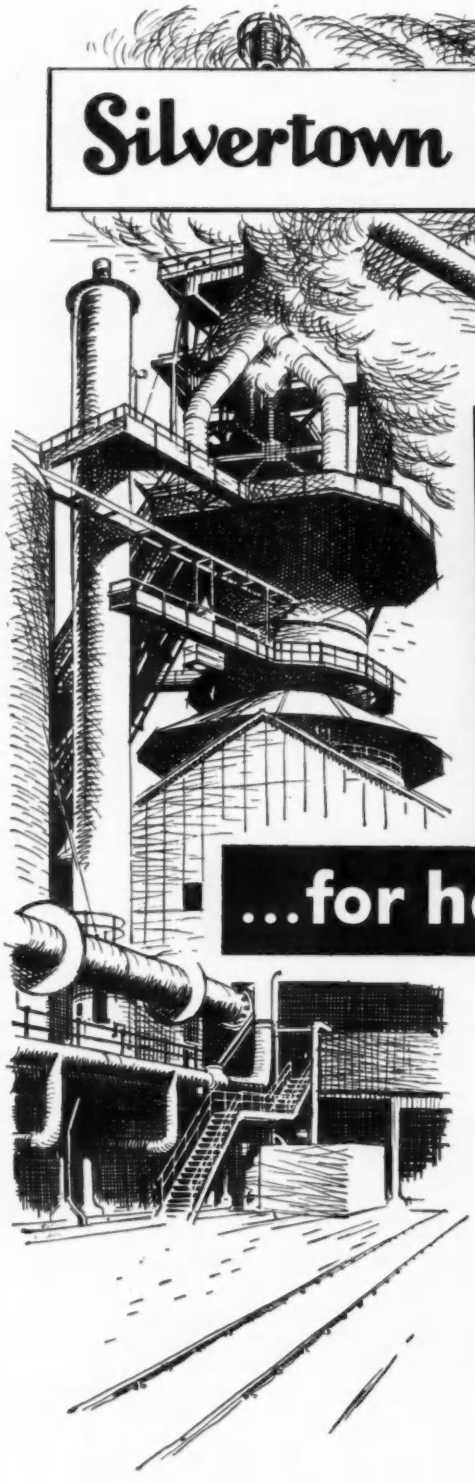

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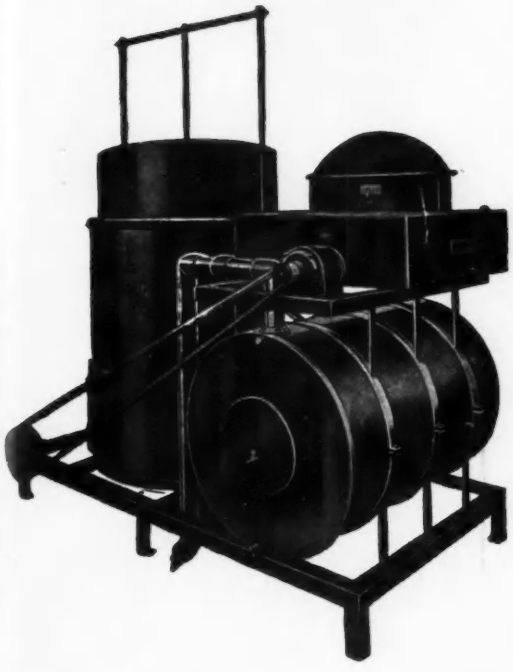

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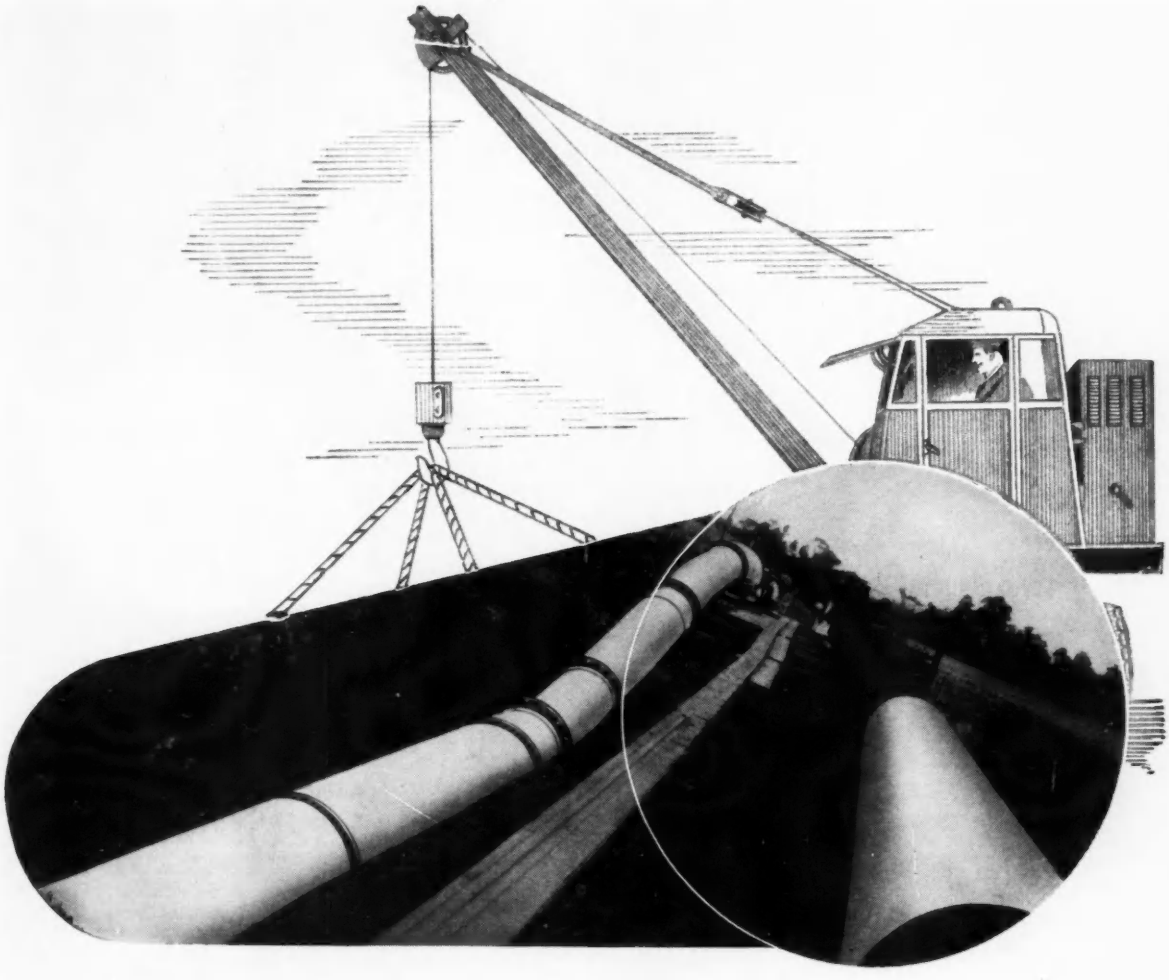

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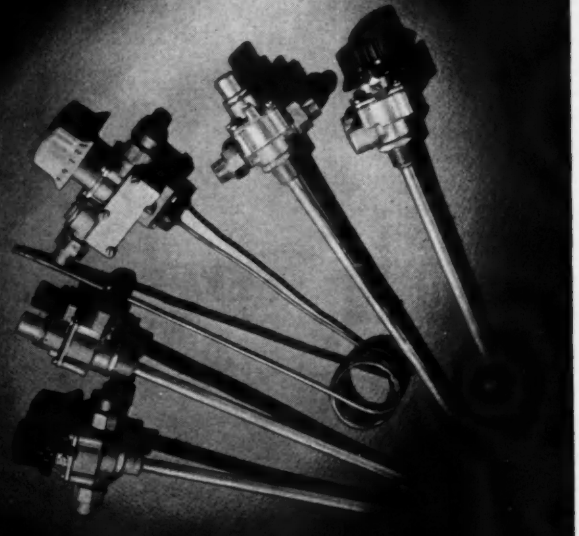

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(*c*) Remote control of flow into station.

(*d*) Remote indication of gasholder stocks, with audible and visible alarms for high and low limits.

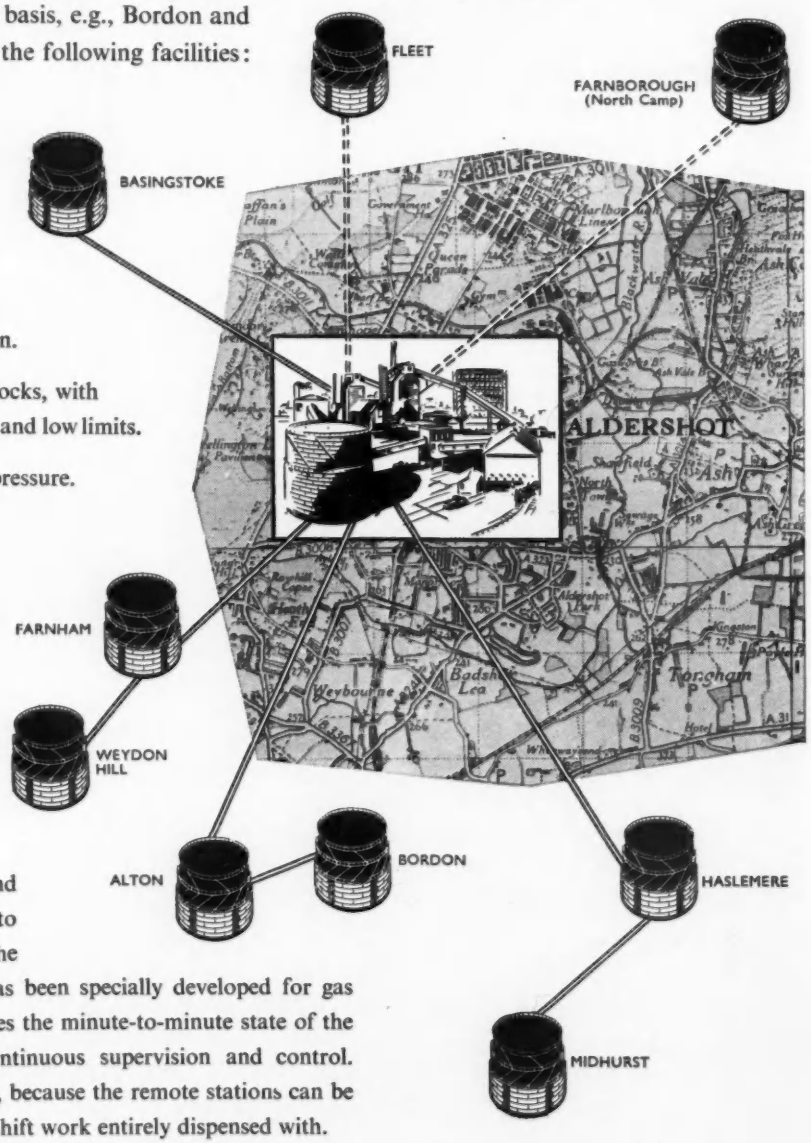
(*e*) Remote indication of the district pressure.

(*f*) Remote control (start/stop) and indication (running/stopped) of the station booster.

(*g*) Remote indication and alarm of electricity supply failure.

(*h*) Equipment testing facilities.

(*i*) Telephone communication.



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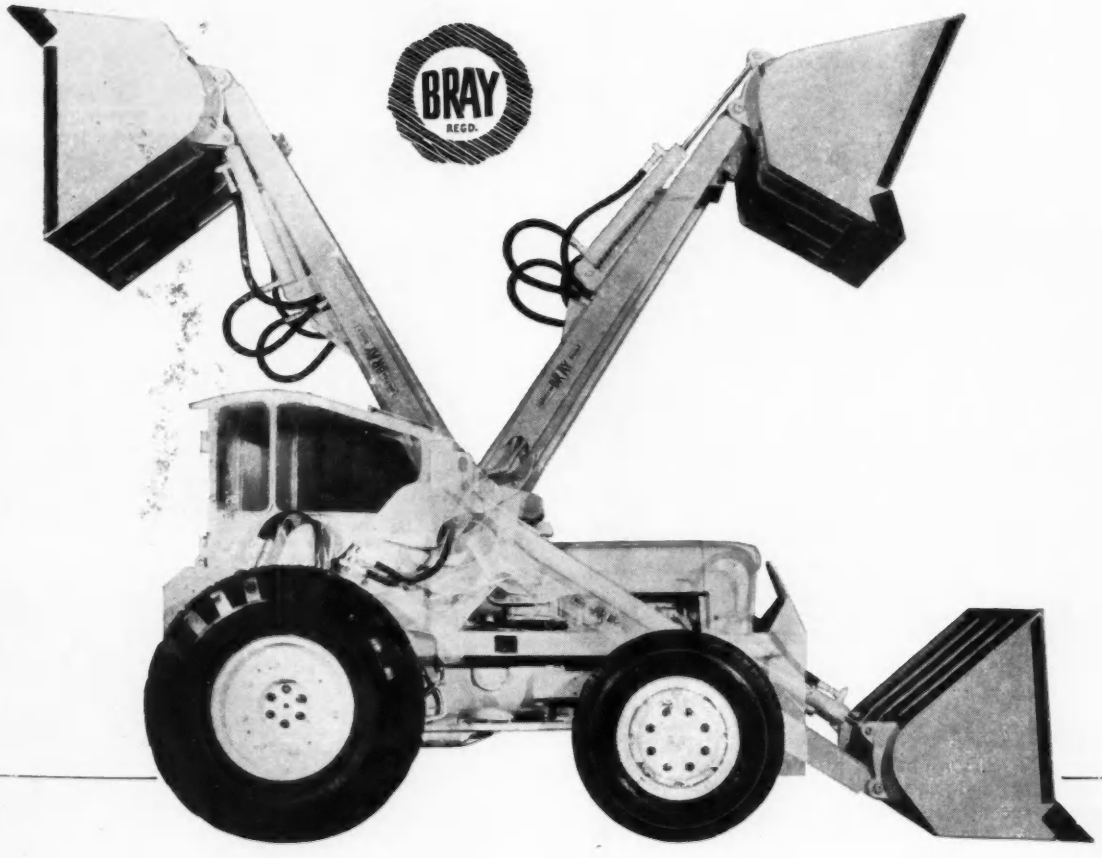

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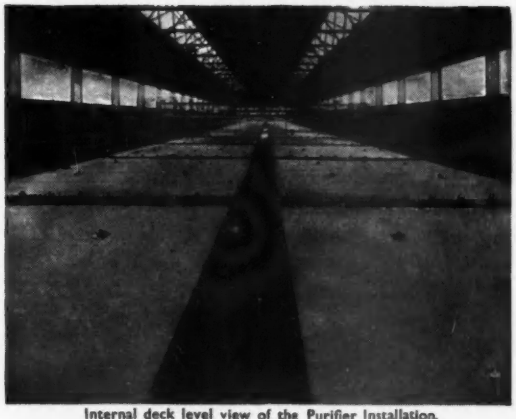
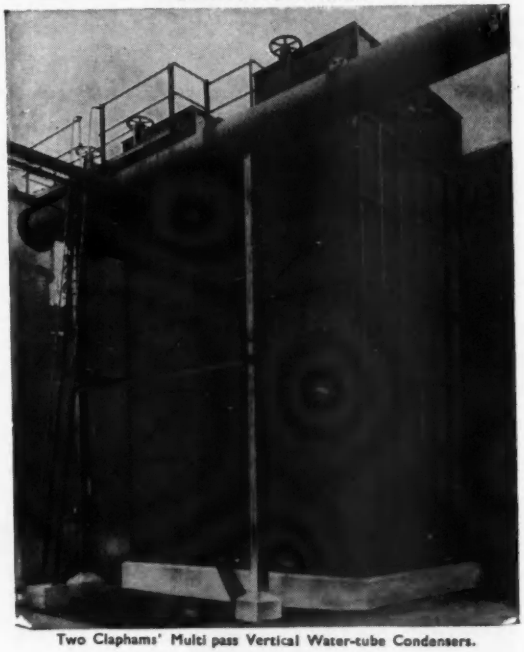


Internal deck level view of the Purifier Installation. (Eight 45 Feet Square Boxes.)



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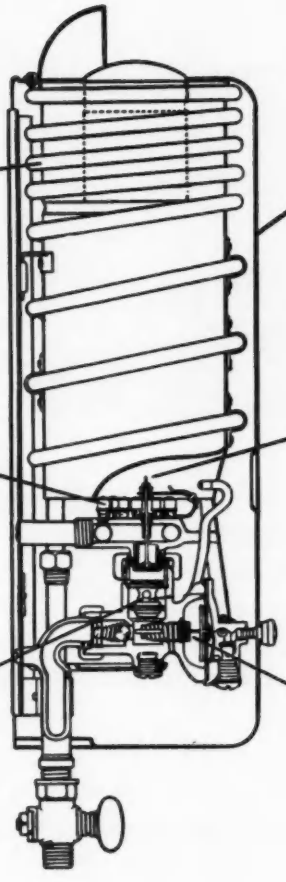

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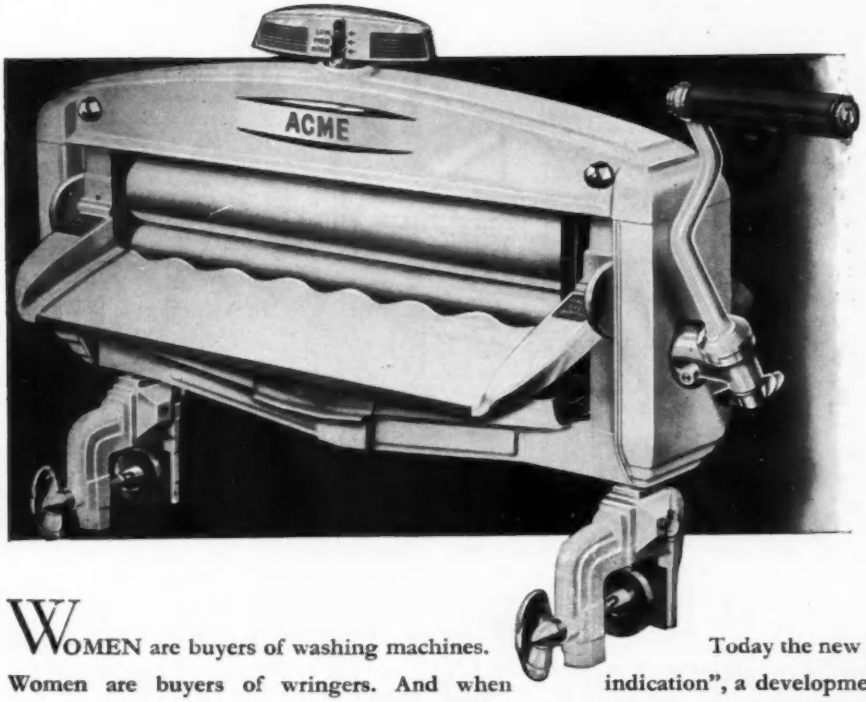

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Gas Journal

VOL. 282 NO. 4792 APRIL 6, 1955

107TH YEAR

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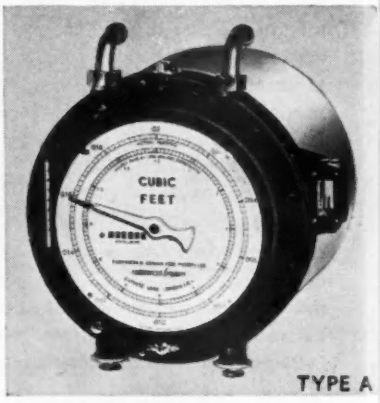

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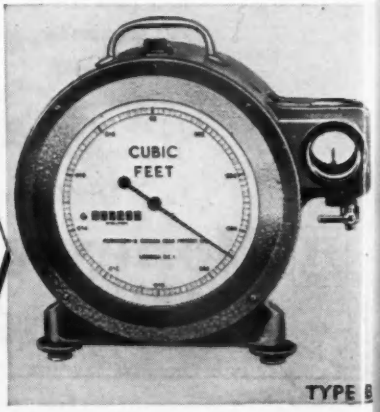

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Gas Journal

VOLUME 282. No. 4792. APRIL 6, 1955. 107th YEAR

Distortion of Retort Settings

THE problem of designing retort settings so that they 'can be brought from cold to working temperature with the minimum of distortion' is one of great complexity. Obviously, the solution must be based upon ascertained data, in the shape of accurately measured thermal expansion of the bricks of the several materials to be used in the structure, but there are many other factors and this data must be supplemented by experience and observation—trial and error—and it will be cordially agreed on both sides that collaboration between operating and constructional engineers is of the utmost value.

In his recent paper, Mr. G. Dougill, Planning Engineer, North Thames Gas Board, has, we think, made a most valuable contribution to the study of the problem in the description of the horizontal retort settings at Beckton and of the steps taken to allow for and to control the thermal expansion of their several parts. His excellent drawings will be carefully and profitably studied. There are many points which may be underlined. The expansion of a wall, for instance, is governed not only by that of its constituent bricks but by the number, nature, and thickness of the joints. Its calculation is complicated by the fact that its temperature may differ throughout its length, possibly from that of the combustion chamber to that of the relatively cold exterior of the setting. The differential expansion of one refractory over another is also studied in the paper. Expansion spaces must be so disposed that there is 'a sufficient weight of brickwork in contact with the buckstays to give lateral stability.' And the steel bracing must be strong enough to ensure that these spaces actually close up when working temperatures are reached.

'Retort bench bracing must be sufficiently strong,' says *King's Manual*, Section 5, 'to keep expansion equal on both sides of the setting and yet sufficiently elastic not to crush the material by resisting it altogether.' Mr. Dougill bases the pressure exerted by bracing on its deflection under the load coming upon it and this, we suggest, is thoroughly sound. His details of construction will be noted with interest, especially the use of calibrated springs (in vertical retort bracing), 'controlled by screw adjustment maintaining a predetermined load on the bracing.' This design is particularly valuable because it is necessary to begin with a definite pressure on the 'green' brickwork. Early in his paper Mr. Dougill remarks upon the additional complication introduced by the use of silica, the expansion of which is not only high in itself but irregular by reason of the reversible expansions which take place at the temperatures of allotropic changes in the silica during heating and by the continued conversion of quartz to cristobalite and tridymite, seldom completely effected in the kiln. Difficulties arising from the former can, to a great extent, be obviated by care in maintaining a progressive rise of temperature in heating up. The latter can give rise to a troublesome 'growth' in silica structures throughout a long period of their life.

'Another difference is that at working temperatures up to 1,400°C. silica maintains its rigidity, whereas firebrick,' and, as Mr. Dougill notes in his next sentence, siliceous and clay-bonded silica, 'becomes very slightly plastic and subject to "creep" so that it can adjust itself to small movements and thus relieve internal stresses.' Silica may crack when siliceous material 'gives.' It may be questioned whether this rigidity of the high percentage silica material is not a disadvantage which in some cases may outweigh its undeniable advantages.

Mr. Dougill's remarks on the control of quality of refractory goods as delivered are of great importance. To secure a really representative sample is the first difficulty. 'Testing of samples is a slow and expensive process.' We think his suggestion that sampling might be carried out at the manufacturer's works is a good one. One would think it might be well, and practicable, to go further, at any rate in the case of a big consignment—to send a qualified man to the manufacturer's works to sample and test alongside the manufacturer's own staff and in his laboratories.

His views on 'ironspots' would seem to be at variance with those expressed in the last report of the Refractories Research Association, which said that there was no evidence to show that these had as much deleterious effect in working as to be dangerous. His remarks on tolerance in dimensions are eminently sensible, particularly that 'sorting into size limits and the blending of these sizes can result in a satisfactory structure with a minimum of brick cutting.'

This paper should be read with the work of the Research Association under Dr. Rigby very definitely in mind. It makes a valuable addition to those studies in the field of the behaviour of retorts and settings under working conditions and over long periods, to the con-

tinuation of which we look forward with so great an interest. Mr. Dougill may rest assured that his paper will be welcomed 'as a record of efforts at improving design,' that constructional engineers will regard it as an important addition to their wide experience of all types of plant, accepting it as 'help and advice' contributed by an operating engineer also of long and wide experience, to the design and construction of the several types of plant which they offer to the gas industry.

Radiation's Record Year

WE measure the progress of the gas industry by a regular cycle of events—the annual reports of the Gas Council and the area boards in the autumn, the annual report of the Society of British Gas Industries in the early summer, and the reviews given by the chairmen at the annual general meetings of the principal gasworks contractors and makers of gas and related fuel appliances whose interests are so inseparably linked with those of the nationalised industry. When we turn to such statesmanlike discourses as that of Dr. Harold Hartley at last Thursday's meeting of Radiation Ltd.—reported on pp. 58 and 59 of this issue—we cannot but recall that the Gas Act gave the Gas Council and the area boards powers in certain circumstances to make their own appliances. That they have not shown any disposition to exercise those powers is in itself evidence of the soundness of the service rendered by private enterprise in general, and especially by those groups of manufacturers with capacity and resources to develop their own research and development sections on the most modern lines. Close co-operation between the two sides of the industry has never been more important than at the present time, when we await Government legislation to deal with the smoke problem, and makers of appliances capable of burning solid smokeless fuels as well as well-established gas appliances are faced with greater opportunities than ever before.

Both in volume and in cash value, sales of Radiation appliances in 1954 set up new records, and more could have been sold had it been possible to step up production still further, but customers had to be rationed and it was not possible for makers of steel sheets suitable for enamelling to keep pace with the increase in demand. The working of the Radiation sales organization was effective and demand grew steadily throughout the year. Dr. Hartley also commended the production centres on the way output had been increased, and said the demand had been maintained so far this year, but the effects that would follow the new restrictions on hire purchase imposed at the end of February were not yet clear. There may be some consolation in quoting what Mr. S. Roberts, Chairman of Hoover, Ltd., said on that subject at that Company's annual meeting last week: 'The new restrictions do not appear so far to have had an adverse effect on sales in the home market; in fact the record week at home for all time took place two weeks after the announcement of the restrictions.'

Dr. Hartley's detailed survey of production and sales showed how thoroughly the market had been studied. As he rightly pointed out, the prime cost of gaseous fuel is higher than that of solid fuel and it is important that gas apparatus offered to the public shall work at a high efficiency in addition to providing the obvious convenience and cleanliness associated with the use of coal gas as a fuel. If the recommendations of the Beaver Committee are implemented and purchase tax is removed from gas space heaters this should lead to a further increase in demand. It was emphasized that the reduction of domestic smoke need not wait on legislation nor on the provision of more smokeless fuel, but can be tackled at once by the raising of the standards of performance to be obtained with apparatus submitted for approval for use by local authorities. Because millions of houses need attention, the reduction of smoke will involve heavy expenditure, and Dr. Hartley again emphasized what he said 12 months ago, that the cost of appliances is so much influenced by methods of production that if specialization in production can be undertaken the price reductions possible are striking. Insistence on the adoption of still higher standards of performance and production of appliances is a necessary preliminary to effective action in the domestic sphere.

Six years ago Dr. Hartley referred to the provision of more space for housing the central research laboratory and staff. The rate of expansion has been determined in part by difficulty in obtaining technically trained staff and in part by limitation of space available at the Birmingham production centre where the section is housed. Development facilities have been extended at other production centres and in addition a start has been made on the building of another research laboratory, primarily intended for background research, at the Chelsea factory. While looking after the home market the Group has not neglected the export field and it is in fact now exporting to some 80 different markets overseas. Arrangements have been made at the factories to deal with increased exports this year, but sales will depend on the stability of conditions overseas and the Group's ability to check price increases.

THE FUTURE OF MINERAL PRODUCTION

WE are indebted to our contemporary, *Coke and Gas*, for a very convenient summary of an important paper on the future development of the coalfields of Great Britain presented by Mr. E. H. Browne, Director-General of Production of the National Coal Board, at the annual meeting of the Institute of Mining Engineers. Apart from the very valuable information it contains about the possibilities of the several coalfields and, of particular interest to the gas industry, the availability of coal which could and should be carbonized, there are some general reflections which we should do well to keep in our minds. 'However great the reserves of coal in total, the prospects of obtaining and maintaining a high productive level are governed by the availability of other forms of resources—human and financial—which must be taken fully into account.'

M. Fernand Blondel, in his Presidential Address on January 7 to the Société des Ingénieurs Civils de France, extended the scope of his reflections over the whole field of mineral resources and production and, geographically, over the entire world. His conclusions are the same as those of Mr. Browne. The word 'reserves,' he says, can only have a precise meaning if it is used to represent the

tonnage of mineral known, more or less approximately, which is susceptible of being exploited economically in existing conditions. Production tends to increase, and with it effective reserves, with rising prices. Unfortunately costs rise with exploitation of existing deposits. In terms of coal, as Mr. Browne puts it, 'very much of the best coal and the coal which is easiest and cheapest to get has gone.' And M. Blondel does not think that, with the exception of petroleum, there is any great likelihood of further sensational discoveries of valuable mineral deposits. 'The best proof of that is that the deposits now being worked have all, with very rare exceptions, been known for at least fifty years.'

We must not follow M. Blondel in his consideration of the effect of the distribution of mineral deposits on international politics. 'At the present time, for most minerals, production and consumption are in a relative equilibrium which corresponds to a certain saturation of consumption. Some think that this situation will last for quite a long time to come.' M. Blondel thinks, 'on the contrary, that this equilibrium is menaced by the very great difference which exists between consumption in the rich countries and that in the poor countries. In some way or another the latter will claim their share; in fact, they are claiming it already.' But, and this perhaps is the point which it is essential for an important section of our community to grasp, for the miners the facts of the situation, 'can only encourage them to increase their efforts and develop their enterprises. There is no risk, at least for quite a long time to come, of their coming up against a lack of demand.'

MR. LLOYD ON COAL

MR. G. LLOYD, Minister of Fuel and Power, has given some important—and some routine—answers to questions in the Commons during the period of the London newspaper strike. Like other Parliamentary news breaking in this period, it is quite likely that these points may lie almost unnoticed except by the questioners themselves, and rest in peace in the voluminous Hansard reports. Here they are then. One questioner asked, reasonably enough, what was happening about poor coal. Equally reasonable was Mr. Lloyd's answer that the National Coal Board was making 'strenuous efforts' to solve the problem. Methods of hand cleaning were being improved, some 140 washeries had been built or extended, another 65 were under construction and some 82% of deep mined coal was now cleaned. The new washeries would account for cleaning an additional 40 mill. tons of coal. Just as significant to the gas industry was his statement that he was discussing with Goverment departments, nationalised industries and other public authorities how they could save coal by using more oil. Government loans were available to industrialists who could make worth-while savings by changing from coal to oil and the use of oil was increasing rapidly. After declaring that coal consumption might increase another 4 or 5 mill. tons in the next coal year, Mr. Lloyd was distinctly evasive about his plans to import coal. It was necessary, he said, to import coal to maintain winter supplies, but it was another matter to suggest that enough should be imported to do away with coal rationing—which he would like to do. Very little can be drawn from this each-way bet. Nor did the Minister commit himself particularly in reply to an earlier question. It was an interesting suggestion of Mr. Nabarro's, he said, that domestic coal might be imported from the Continent where soft currency existed to get rid of house coal rationing in this country. But it must have been to the accompaniment of a sigh of relief when he told the House that he did not think the distribution of unrestricted types of solid fuel could be improved by the introduction of new controls. Other questions followed the usual pattern and evoked the usual sort of reply. The Minister doubted if a leaflet and poster campaign showing the respective thermal content, domestic and smoke diminution values of various types of fuel and power would serve a useful purpose. Much progress had been made by the Coal Utilization Council and it was better that housewives should have advice from trained men than be confused by a table of thermal statistics. Mr. Ian Winterbottom (Lab. Nottingham Central) asked a question to which Mr. Lloyd replied that the Government's policy was to encourage the search for oil and natural gas in the United Kingdom and the proper development of any fields that were found.

WOOD PRESERVING

THE election of Mr. W. K. Hutchison (Chairman of the South Eastern Gas Board) as one of the two new Vice-Presidents at the annual meeting of the British Wood Preserving Association in London last Wednesday was both a personal tribute to the Senior Vice-President of the Institution of Gas Engineers and a recognition of the vital part played by the gas industry in the provision of creosote and chemicals employed in wood preserving. Formed before the war the Association did not make much progress until after the cessation of hostilities, when shortages of softwoods and other circumstances stressed the need for protecting all kinds of wood from destructive attacks. In the last few years it has grown until it has now a total membership of 337, including the Gas Council, the 12 area boards, many coke oven and low temperature carbonization undertakings and all the tar distillers. Mr. Stanley Robinson, of the Midland Tar Distillers, succeeded Major A. G. Saunders, of the Price Regent Tar Co., Ltd., as President last year, and at last week's meeting Mr. Thos. G. Robinson was nominated as President-Elect, which means that in the ordinary course of events he will follow his namesake in the Presidential chair in 1956. Mr. Hutchison's election as Vice-President was coupled with that of Mr. W. E. Vesey, of Christie & Vesey, Ltd., to similar office. The most notable event in the Association's calendar is its annual convention usually held at Cambridge at midsummer, and already plans are well advanced for the 1955 meeting. The six to eight papers presented to the convention usually include some aspects of the application of coal tar creosotes and other gasworks products as wood preservatives. Telegraph poles and railway sleepers in every corner of the country bear silent testimony to their effectiveness. Such an Association depends very largely on its Secretary and his necessarily small staff, and there was unanimous endorsement at the annual meeting for the President's praise of Mr. W. E. Bruce, M.A., and his few helpers, in ensuring that the Association runs so smoothly and successfully.

Lord Chandos, President of the Institute of Directors, opened the Institute's new headquarters in Belgrave Square, London, on March 23. Membership of the Institute has doubled to 14,000 in the last year and continues to expand rapidly. Emphasizing that the new building would not be a club, Lord Chandos said: 'I hope this will be a centre to which directors will naturally gravitate when they have finished with their shareholders and their solicitors.' A Private Member's Bill, the object of which is to ensure the application to directors and officers of limited companies of the principle of the Common Law that in case of criminal proceedings, the onus of the proof must rest with the prosecution, is being sponsored by Mr. F. P. Crowder, Conservative M.P. for Ruislip-Northwood, who is a barrister. The text of the Bill was published on March 23.

Correspondence

IN DEFENCE OF YOUTH

DEAR SIR.—We were at a loss to find any purpose in the veiled and unveiled references to the junior gas engineer and to youth in general at the Scottish Western Juniors' Jubilee Dinner. This was a dinner given by the Juniors to celebrate both an anniversary and the achievements of the past. It hardly seemed an appropriate moment for an attack; a board conference or routine meeting would have provided a better forum than a celebration dinner.

Speakers made comment on the tendency of the young man to let opportunity slip through his fingers and not to take up the reins of responsibility. Perpetual attacks are made these days, and this example alone cannot be singled out. True, the country carries at the moment an unprecedented criminal population, Edwardian boys, good-for-nothings and other unspeakable sects which in the heat of the moment draw comment and shame on the coming generation. Is the younger man of today to believe that he is worse than anything the world has yet produced? It looks like it, and it is a pity; for nothing can more undermine one's confidence than lack of confidence from one's seniors.

Perhaps the 'older generation' would look back to their younger days and ask themselves a few questions. Did not *their* seniors say they were lacking in drive and initiative, and have they not made good? Did not their generation after the 1914-18 war go through curious spasms over which history has drawn a veil most conveniently? Did not they have their modes and activities which drew ridicule from their fathers? Did not they themselves think that those eccentrics were the minority and therefore not worth discussion? The 'elder' of today would do well to do likewise. Youth has yet to let these islands down, and there is no good reason to think he would. Queues were formed in 1914 and queues were formed in 1939, and the youth of both generations met a match which was nearly too much for them; but their fortitude and resourcefulness brought them through. Perhaps the mistakes of those fateful days lay with the 'elders' who should have brought their fears to the surface and dealt with them with the alacrity and initiation which they demand of their juniors. There are thousands of young men in these islands today in the tender years of the twenties, who have had the responsibility of scores of lives in their hands.

Responsibility will be grasped hard and fast by the young generation of today; yet in retrospect one cannot help marvelling that our industry is and always has been well endowed with young men who carry grave responsibilities which they manage to temper with a wit and humour only accredited to the great.

Too many people today consider themselves old who are not old and as yet should not look back on their successes—at least for another twenty years. Then perhaps they can call the odds and call them loud and long. They may also by then have realized that humour is a necessary rider to greatness, and advice will then be taken without criticism. Let the elder brethren of our industry be tolerant and confident of the younger man. Spread the load of responsibility to him and give him time to make mistakes. Give him confidence in himself and remember your own shortcomings; above all give him credit sometimes.

Yours faithfully,

'A JUNIOR'

Personal

SIR ROYDON DASH, D.F.C., Guildford, Chairman of the Stevenage Deevlopment Corporation, has been appointed by the Minister of Fuel and Power as a part-time member of the South Eastern Gas Board. The appointment dates from April 1.

COUNCILLOR A. B. CONSTABLE, M.A., B.SC., Dover, has been reappointed by the Minister of Fuel and Power as Chairman of the South Eastern Gas Consultative Council. The reappointment takes effect from September 24, 1955. ALDERMAN W. H. MALCOLM, J.P., Coventry, has been reappointed Chairman of the West Midlands Gas Consultative Council.

MR. ALFRED CAMPBELL, Chief Showroom Assistant in Glasgow under the Scottish Gas Board, has retired and to mark his retirement received gifts on March 25 at a gathering in the Sauchiehall Street showrooms. Mr. R. Buchanan presided and Mr. A. Bujnowski, Sales and Service Officer, Glasgow, handed over a cheque from the staff, with a gift for Mrs. Campbell. Several of Mr. Campbell's colleagues paid tribute to his worth. Mr. Campbell entered the service of Glasgow Gas Department in 1906 in the gas-fitting section in Walls Street, transferring in 1910 to the showrooms at 130 Sauchiehall Street. After two years in Canada he returned to join the Lanarkshire Yeomanry and was afterwards transferred to the 2nd Batt. H.L.I., seeing service in France. On demobilization he rejoined the Department and in 1935, when the present Sauchiehall Street showrooms were opened, he became a member of the staff there.

Obituary

MR. GEORGE W. JONES, Chief of the Gas Explosions Branch, Central Experiment Station, Bureau of Mines, Pittsburgh, died on March 4, a few days after his 64th birthday. During four decades with the Bureau of Mines he gained recognition as a leading American authority on gas explosions. He joined the Bureau as a junior chemist in 1915 and devoted his whole career to studying the hazards of combustible materials and developing effective means of preventing explosions. He came to England in 1925 to work with Dr. H. P. Coward, of the British Safety in Mines Research Board on a co-operative project in which the Bureau was engaged. As a result they wrote 'Limits of Inflammability of Gases and Vapours,' which was first published in 1928 as Bureau of Mines Bulletin 279. The demand for this publication has always exceeded the supply. Revised several times, it is still considered the Bible of flammability data all over the world. Mr. Jones had been Chairman of the Committee on Hazardous Chemicals and Explosives of the American Chemical Society for 17 years. He was a member of the American Standards Association, the National Fire Protection Association, the Committee on Hospital Operating Rooms of the Public Buildings Administration (now Service), the President's Conference on International Safety, the Inter-Agency Committee on Ammonium Nitrate Explosions, and the group's Sub-committee on Tests, and the Sub-committee on Gas Space Heaters of the American Gas Association.

Calendar & Directory

ALTERATIONS

THE following changes have been notified during the past month. To keep the information in the current 1955 edition of the GAS JOURNAL CALENDAR AND DIRECTORY up to date readers are invited to note these alterations in the Directory section.

Page D30.—CAISTOR: Delete M. E. Walker, *M.*, deceased.

Page D33.—DISTRICT 6 (Worksop, East Retford, and Misterton): Delete F. Beaumont, *District E.*, deceased.

Page D52.—STAINES, HIGH WYCOMBE AND ASCOT: Title *Works M.* now *Station Engineer* in each case.

Page D57.—CENTRAL DIVISION: G. H. W. Madge, *Divisional M.*, vice A. F. Hetherington; Western Division: D. H. Rouse, *Divisional M.*, vice G. H. W. Madge.

Page D75.—SOUTH EASTERN: Add R. M. Farror, *Assistant Chief E.*

Page D89.—SOUTHERN: K. G. Poland, *part-time Member.*

Pages D89 and D91.—CENTRAL AND NORTHERN DIVISIONS, Southern Gas Board: F. G. Symon, *General M.* of both Divisions following the death of A. Tran.

Page D117.—INNERLEITHEN: Delete E. Shiell, *District M.*

Page D118.—PEEBLES: E. Sheill, *District M.*, vice L. Farquhar.

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Smoke Abatement and the Law*

By ARNOLD MARSH, O.B.E., M.SC.TECH., M.INST.F.†

THE Beaver Committee has presented its final report on air pollution and its recommendations have been accepted by the Government. A Private Member's Bill, based on the Beaver recommendations, has been introduced by Mr. Gerald Nabarro and debated in the House of Commons, when it was withdrawn on the Minister of Housing and Local Government giving a definite assurance that the Government would introduce its own more comprehensive Bill during the present session. This Bill is now being drafted, and may be published within the next few weeks. The case for new legislation has been accepted by the Beaver Committee and now by the Government, and therefore there is little value or interest in going over that ground again in any detail at the present time. A brief survey of legislation on air pollution in this country may however be given in the hope that it may assist appreciation of the changes that are now imminent.

Attempts to prevent nuisance from smoke have been made ever since coal began to be used in any quantity. As far back as 1307, for example, it was decreed that the new fuel should not be used in London for manufacturing purposes (at that date no one thought of using it in the home), but economic necessity prevailed, and the pollution of the atmosphere increased steadily through the centuries, as one of the unfortunate byproducts of an industrialization based on coal. Early in the 19th century the problem became so acute, even though it was still regarded as inevitable, that demands began to arise for its moderation. As the new idea of a public health policy began to grow, even though it was based mainly on sanitation, housing and pure water, the condition of the air also began to be seen as a question of the public health, and the major legislation that eventually came was a part of the great Public Health Act of 1875. This remained in force until 1926, when an amending act, the Public Health (Smoke Abatement) Act was passed. Later, this became a part of the consolidating Public Health Act, 1936.

The changes in the law in 1926 were the outcome of the report of the Newton Committee on Smoke and Noxious Vapours Abatement of 1920, but nearly all of the most useful new features—byelaws for smoke other than black, control over new installations, though only for space-heating and cooking in non-domestic premises, and revision of the schedule of special processes—have never been operated.

Apart from some recent local Acts, we are in fact still attempting to prevent air pollution by methods introduced three-quarters of a century ago. Considering the unparalleled technological advances that have taken place during this period in the field of fuel utilization, combustion engineering, and the like, it certainly seems that it should be possible to devise more modern and effective methods of preventing or controlling the emission of smoke.

The principles of the 1875 and 1926 Acts are, in fact, based wholly on the idea of *nuisance*. They do not seek to prevent air pollution, or even to prevent nuisance from arising, but simply to allow action to be taken against emissions so gross that they could be defined as nuisances. Where pollution is excessive and mitigation only can be hoped for, such methods of control can do a great deal of good, but even at their best they cannot do anything to reduce the vast amount of pollution that is caused by large numbers of sources of pollution, not one of which may be technically guilty of a legal nuisance. If we are to secure a steady improvement in the condition of the atmosphere it is necessary to discard the old 'nuisance' criterion and to aim at either complete abolition or the nearest to it that is practicable.

Not only are the principles of the old legislation inadequate, but there are faults and omissions that prevent them from being used as well as they might be. There is, for example, no control whatsoever over domestic smoke; although by-laws were made possible under which proof of nuisance was not required, they have not been allowed for any kind of smoke that is not black, and there is of course the notorious so-called Sheffield clause, which gives a virtual veto on action against certain metallurgical and mining processes. One of the failures of the 1926 Act was the retention of this clause, even though power was given for the schedule to be revised. Assurances were given in Parliament, during the debate on the Bill, that the processes would be reviewed at the end of five years. This, however, has never been done.

It is unnecessary to go into further detail about the present legislation, which it is hoped will very soon be dead, and to sum up one may quote from the Beaver report:

'It became clear to us at an early stage of our inquiry that the present law for the control of smoke and other visible pollutants needed considerable revision and strengthening . . . . the law has failed to achieve its purpose, notwithstanding that it has been in operation for many years and that considerable progress has been achieved in the technique of smoke prevention.'

The Beaver Proposals

The advance in legislation proposed by the Beaver Committee, and which it may be assumed will be included in the Bill to be introduced in the near future, may now be considered briefly. First, although the control of emission by visual observation is retained, the allowable standard will be much stricter; proof of nuisance will disappear, and 'black smoke' will be replaced by 'dark smoke,' which it defined as the No. 2, mid-grey, shade on the Ringelmann chart. Under the by-laws at present being operated the period of allowable emission for black smoke is in most instances two minutes in any thirty minutes. In a few cases the period is three minutes in thirty. The Beaver recommendation is that no single burst of dark—that is, more than mid-grey—smoke should last more than three minutes; and that there should be a total upper limit of six minutes in four hours.

Under existing standards up to 16 minutes of black smoke could be emitted without infringing the by-law, so that on the face of it there is a considerable advance in both the allowable period and in the allowable density of emission. It is presumably not intended that the chimney should be watched continuously for four hours, but assumed that the possibility that it is being watched will act as an effective deterrent, especially after one or two bursts. The proposed new standards, as the old, suffer of course from the inevitable difficulty that observations can be made only during daylight hours. It is proposed that this section of the new law should not come into operation for three years: a delay which perhaps need not matter very much if it is made known that it will be firmly implemented at the end of the period. It is recommended that the emission of grit and dust should be reduced and controlled by requiring the use of grit arrestors in all pulverized fuel burning installations, and in all other solid fuel-burning plant using 10 tons or more an hour.

'Certain industrial processes' which present special difficulties should be included, it is proposed, with the processes already controlled under the Alkali, &c., Works Act. These processes would include the metallurgical and mining processes as listed in the present Public Health Act (if they do present special difficulties), power stations, gasworks, coke works, ceramic works and lime works.

Under the Alkali Act all new installations have to be approved by the Inspectorate beforehand—the principle of prior approval, which is used widely in many other activities of public concern and in the prevention of air pollution, where it is the accepted principle, in United States, Canadian and other legislation. It is the logical way of trying to ensure

* From a paper presented to the Yorkshire Section of the Institute of Fuel at Sheffield on March 16, 1955.

† Director, National Smoke Abatement Society.

that conditions are not created which may lead to air pollution. The same principle, it will be noted, is proposed for the ordinary (as opposed to the special) industrial processes, but only in respect of grit. For ordinary installations, with respect of smoke, the Beaver Report proposes only the somewhat weak voluntary form of prior approval that is already included in a number of recent local Acts. Here it is laid down that new installations must be capable of being operated smokelessly, but that action for default cannot be taken *if* prior approval had been requested and had been granted. This procedure is not without value, but disappointment has been expressed that straightforward prior approval has not been recommended for just the one sector of industry that many consider is the one where it will be most useful. If it is desirable for the special processes, for pulverized fuel plant, and for grit prevention generally, what principle makes it undesirable for ordinary steam-raising plant in respect of smoke? It means, it is argued, that the small factory owner is still free to instal any old plant he pleases (literally, perhaps) without any technical advice. If a smoke problem is the result time and money will have to be devoted to controlling it (or dark smoke may perhaps be avoided by the simple expedient of diluting it with excess air!).

It has been said that industry does not like compulsory prior approval because it may mean the examination of secret processes. But surely secret processes are more likely to be found among the special installations to be subject to prior approval by the Alkali Inspectorate, who in any case have been exercising prior approval for many years for the processes they already control. This seems to have worked satisfactorily, and no objections seem to have been raised.

This is one of the few points in the Beaver report on which there is disappointment or disagreement. The other most controversial proposal is that already mentioned: the control of special processes by an expanded Alkali Inspectorate. For everything else the report recommends that the local authorities should continue to be responsible—and indeed their responsibilities will be considerably increased. It is felt by many, including not unnaturally those who have seen in this area the work of the only statutory joint committee of local authorities, that the special processes too should be the responsibility of the local authorities, singly or grouped.

There are arguments of substance both for and against the proposal, and an attempt may be made to set them out as follows. For the proposal it is said:

(1) The control of the special processes requires a relatively small, but highly trained inspectorate. It would not be practicable for local authorities individually to employ such men, and therefore a central inspectorate cannot be avoided.
(2) It will take time to train a corps of men of the right calibre, and this can be done more rapidly and effectively by a central body than by a large number of local authorities.
(3) A central inspectorate could make possible standard practice throughout the country, and it could be readily kept up-to-date on new and improved methods.
(4) The local authorities will have their hands full in dealing with their increased responsibilities as proposed elsewhere in the report, and this may not be done so well if in addition they have to contend with the special processes.

To this the opposition replies as follows:—

(1) Effective prevention of air pollution calls for intimate knowledge of local problems and conditions, including awareness of local public opinion, and this can only be achieved by officers of the local authority. Prompt, personal action can be taken only by the man on the spot.
(2) Consultants can be called in for unusual and especially difficult problems, and existing co-operation with the Alkali Inspectorate can be maintained and developed.
(3) The case of the smaller authorities, who could not usefully employ specialist inspectors, could be met by joint committees of similar regional groups.
(4) Dual control of air pollution is bound to be wasteful and must increase the manpower difficulties likely to be experienced during the next decade or so.

Mr. Nabarro, in his recent Bill, sought to achieve a compromise on the matter by proposing that the special processes should be the responsibility of the Alkali Inspectorate except in the case of local authorities who possess the necessary facilities and technical staff—the Ministry to decide whether or not this was the case. This seems to have met with some approval, although it has been criticized because it would create an administratively rather untidy situation.

One or two observations may be added. It seems to be most important that the special processes should be subject to very careful prior approval, no matter who is nominally responsible. Secondly, the Beaver report does envisage the control of the special processs reverting to the local authorities when the problems that make them special have been satisfactorily solved. And thirdly, the report has a small comment that it is hoped will not be overlooked. It said: '. . . a larger number of inspectors working within smaller districts would make for closer collaboration with the authorities. The local authority inspectors and the central inspectorate should be regarded not as separate entities but as a partnership working together for the solution of a common problem which is of national as well as local concern.'

The Domestic Side

The other part of the Committee's legislative proposals break new ground, as far as national legislation is concerned, in proposing to bring the prevention of domestic smoke under the law. They accept the principle of smokeless zones, first advocated by the National Smoke Abatement Society and already proving to be of great value, and put forward the notion of smoke control areas. These would be areas where industrial smoke cannot be completely forbidden, and where domestic fuel need not—initially at any rate—be entirely smokeless.

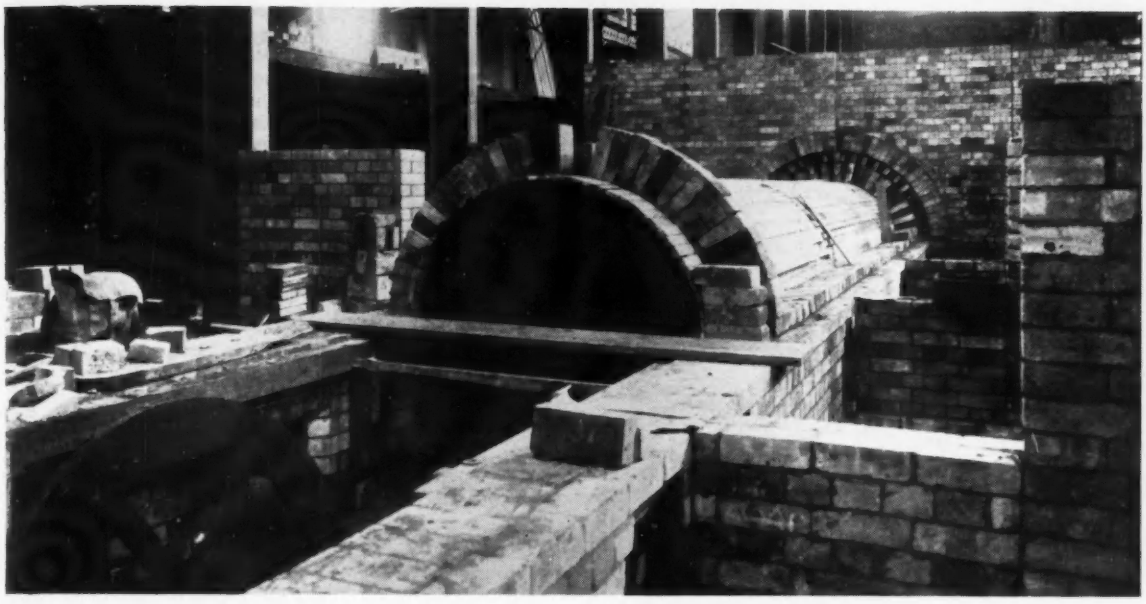
Unlike the industrial problem, domestic smoke can in general be prevented only by ceasing to burn raw bituminous coal. The reform can therefore proceed only at the rate at which smokeless fuels can be made available to replace raw coal, and consequently the report envisages a progressive establishment of smokeless zones and smoke control areas in which the towns and districts that most need it will be given priority. It will be a long time before domestic smoke prevention can be applied to the rural areas and smaller country towns, and for the present it will probably be necessary not to encourage in such areas any further use of solid smokeless fuel.

Some alarm has been expressed on the difficulties that will arise—and indeed may even now be starting to arise—if smokeless fuel becomes too popular too quickly and if too many smokeless zones are established. The present private Acts with smokeless zone powers make it necessary for each zone to be sanctioned by the Ministry of Housing and Local Government, and it is certain that this control will be included in the new legislation. The rate of establishment and extension of smokeless zones can therefore be regulated in accordance with the availability of smokeless fuel.

The question of making available the smokeless fuel, solid and otherwise, and ensuring that it is of the quality and price required, is a subject outside the scope of this present review, important though it is. It may however be pointed out that there has been a kind of circle of difficulty, almost a vicious circle, in that developments in the production of solid smokeless fuel have been held back because there was no certainty that more extensive smoke prevention measures would come and create the demand for it, while, at the same time, there has been a fear of introducing new legislation because there would be insufficient smokeless fuel. What we have to do is to ensure that the circle starts moving the other way round—to see that the establishment of smokeless zones encourages the further production of smokeless fuel, which in turn will make further zones possible. It may not be easy to achieve this smoothly, and yet make good progress, and it is likely that for some years to come there will have to be a near-shortage of smokeless fuel.

To one whose task it is to assist in breaking down the great wall of apathy that has been such a barrier to progress towards clean air, perhaps the most encouraging feature of the present situation is the important change in responsible public opinion that has followed the Beaver report. The National Smoke Abatement Society urged the Committee, if it agreed that public opinion was of primary importance, to begin the good work themselves with a report that would make a strong impact on public and press alike. Thanks to what one journal called its 'forceful and almost angry' tone, this has been achieved

(*Continued on page 48*)



A view of the main flue during construction showing it passing through division wall.

*Distortion of Carbonizing Plant by Heat**

By G. DOUGILL, M.Sc., F.R.I.C.†

THE problem of designing carbonizing plant which can be brought from cold to working temperature with the minimum of distortion is an important one. Engineers controlling the construction of such plant remain in contact with, and repair, the plant they have constructed throughout its ensuing life. The greater part of resetting work is carried out by contractors, and they have a very wide experience of all types of plant, but it is never possible for them to have that same close contact as gas engineers have throughout its working life. It is necessary that gas engineers endeavour to supply contractors with help and advice in the construction and resetting of the plant.

At Beckton we have reset our nine horizontal retort houses by our own labour for many years. One retort house is reset each year, so that a permanent staff is engaged upon this work. After some four or five resets, that is after some 40 years work, it is found desirable to rebuild the division walls and arches. The first house to be reconstructed was our No. 1 retort house, when advantage was taken of this reconstruction to include any alterations or improvements which would only be possible on a major job of this type.

To give an idea of the size of the problem, Table I shows the area of hot retort walls which must be maintained in gas-tight condition for some normal units of plant:—

TABLE I

Type of Plant	Throughput, Tons of Coal per day	Area of Retort Walls sq. ft.
Horizontal Retorts	450	30,000
Intermittent Vertical Retorts	700	39,500
Continuous Vertical Retorts	360	22,800
Coke Oven Plant	600	17,600

The average area is some 70 sq. ft. per ton of coal per day. Not only is the area of brickwork great, but the overall expansion of silica carbonizing plant is also very large. For instance:—10 settings of horizontal retorts at 10 ft. centres will have a longitudinal expansion of 15 in., and a 20 ft. retort increases in length by 3 in.; also, any inaccuracy in dealing with these expansions is cumulative.

This problem was intensified by the introduction of silica, since not only is its expansion approximately double that of firebrick but this expansion is irregular due to reversible allotropic changes during heating. Another difference is that at working temperatures up to 1,400°C. silica maintains its rigidity, whereas firebrick becomes very slightly plastic and

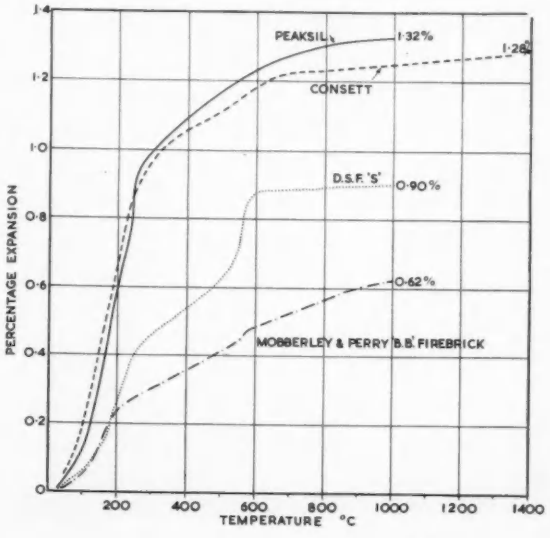


Fig. 1. Thermal expansion curves for silica and firebrick.

* From a paper presented to the London and Southern Section of the Institution of Gas Engineers on March 15, 1955.

† North Thames Gas Board, Beckton Works.

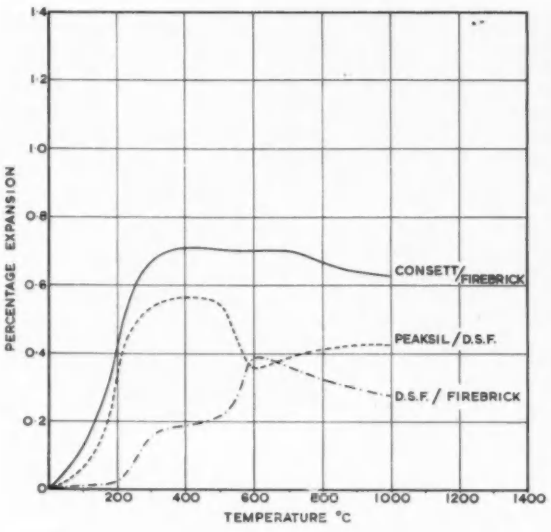


Fig. 2. Relative expansion of two superimposed dissimilar refractory bricks

subject to 'creep' so that it can adjust itself to small movements and thus relieve internal stresses. The same condition also applies to siliceous and clay bonded silica materials.

Expansion curves are shown in Fig. 1 for Consett lime-bonded silica, Peaksil lime-bonded material, D.S.F. siliceous brick, and firebrick.

The very rapid expansion of lime-bonded silica between 100 and 250°C. is striking. Compared with this the siliceous material and the firebrick material are comparatively much more regular in rate of expansion although both materials show the effect of the presence of some silica in the mix.

We are also interested in the expansion of one brick relative to another since it is frequently necessary to have different materials in different parts of the setting. Curves are, therefore, shown in Fig. 2 for the relative expansion of two superimposed dissimilar bricks. In these curves it is assumed that the upper brick is the most refractory since this is the order usually met in practice.

The expansion of the upper brick relative to the lower brick is shown, so that where the curves rise the expansion of the upper brick is greater than that of the lower and, of course, where the curves fall it indicates the reverse procedure. If, therefore, there is at any level a change of material it will be seen that during the early part of the heating up period the greater expansion of the upper course will tend to open the joints of the lower course, whereas at a later stage the greater expansion of the lower course will tend to open the joints of the upper course. Thus, wherever such changes of material are necessary it is desirable to limit the length of such joints or to make the joint with a graphite lubricant, or both. There is also the inevitable change in expansion of the material at the working temperature of the combustion chamber to the cool surface on the outside of the setting and at the foundations.

Conditions at No. 1 Retort House, Beckton

No. 1 retort house consists of 30 settings, each of 10 retorts, in five tiers. The retorts are 20 ft. long and the 30 settings were divided into two benches of 15 settings, 150 ft. between buttress walls (Fig. 3).

The arches and division walls were last rebuilt in the year 1912, and since that time the settings had probably been reset four times. During the early 'twenties silica was introduced for the retorts, and the buttress walls and buckstays had been considerably over-stressed due to quartz conversion in the setting, with a consequent permanent expansion.

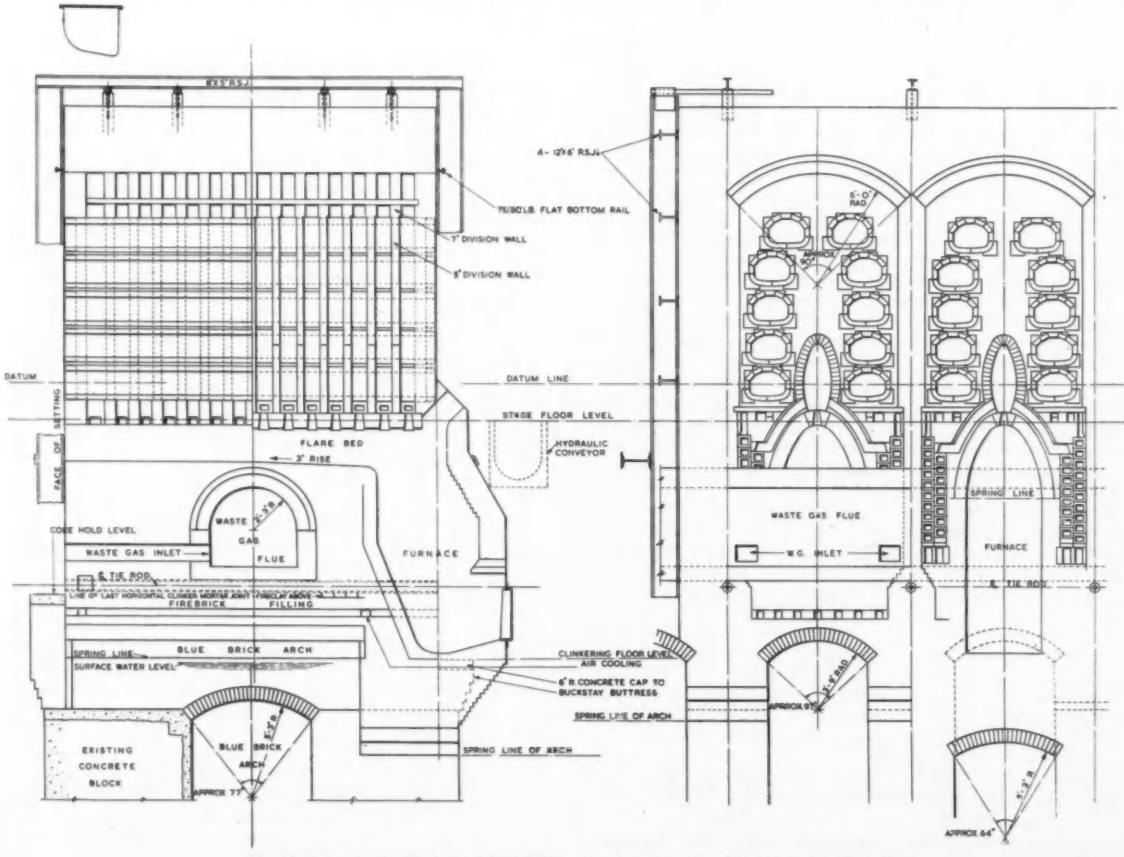


Fig. 3. Sections through the settings in No. 1 retort house at Beckton.

The ground on which the settings are constructed is heavily water-logged and the standing water level is usually less than a foot below the ground surface. The foundations consisted of concrete piers sunk to gravel at about 30 ft. depth. These piers supported concrete arches which formed the base of the setting. Steam from the standing water had, however, in many cases damaged the concrete arches, and examination showed that the piers would require topping with completely new arches (Fig. 4).

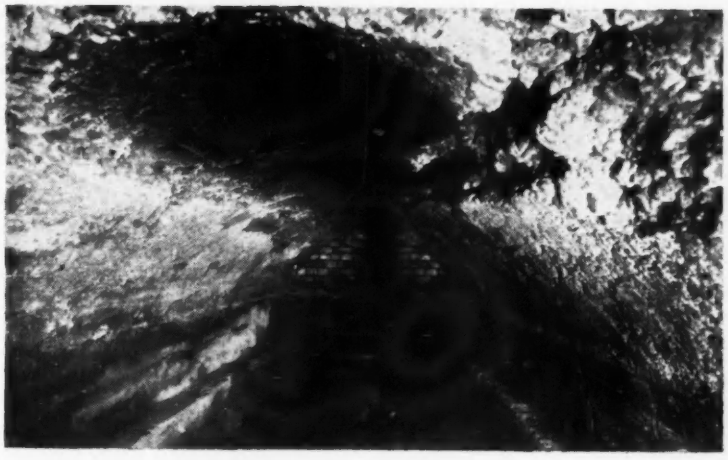


Fig. 4. Concrete foundation arch after 40 years' work.

Setting Design

Foundations, Setting Walls, and Arches

Any defective concrete on the top of the piers was cut away until good material was found. The tops of the piers were then reconstructed in concrete and blue brick arches spanned the space between the two piers under the line of each division wall. From this base two barrel arches were constructed at different levels to form the base of the setting.

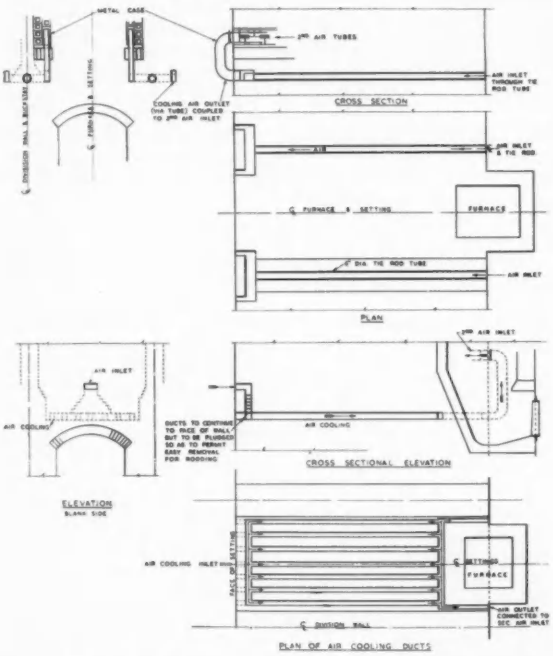


Fig. 5. Detail of the air-cooled tie-rods and foundations

The reason for the different levels is that in order to gain depth the producers have to be partially below the normal base of the setting. This necessitates the tie rods between the bottoms of the buckstays being above the level of the bottom of the producer. Any rise in water level was known to cause steam so that it was most important to minimize heat flow down into the foundations. Considerable satisfaction had been experienced in the use of air cooled foundations installed by Woodall-Duckham Construction Co., Ltd., on our No. 3 battery.

It was not found possible to utilize this design for retort settings. Calculations, however, showed that the volume of secondary air required for each setting was ample for absorbing most of the heat which would normally escape into the foundations, and the base of the setting was finally designed as follows, (Fig. 5).

The circular tie rods, 2½ in. in diameter, at the bottom of the buckstays, were laid in 7 in. diameter cast iron tubes and the air required for the two blank side secondary air slides was drawn through these tubes from the fire side. Airways were left in the brickwork at the same level underneath the main flue and air was drawn through these passages from the blank to the fire side secondary air ports. All airways were straight with provision for blowing out any deposited dust. In practice both these air systems have worked very satisfactorily. The tie rods remain below 100°F. and heat from the base of the settings was prevented from passing down into the concrete foundations.

It will be noticed that blue brick arches were used instead of concrete arches as these would be much more stable towards the action of water or steam (Fig. 6).

The next consideration which exercised our minds was the best method of designing the division walls and setting arches. Since the buckstays were tied rigidly at the top and bottom, it was necessary to make provision for the expansion of the division walls. This would amount to approximately 1.4 in. and if not allowed for would inevitably overload the buckstays. Three vertical stepped expansion joints were left in the 18 in. division walls, one in the centre and the other at 5 ft. from each face (Fig. 7). These expansion joints were carried right through the top arches. In this way there would be a sufficient weight of brickwork in contact with the buckstays to give lateral stability (to

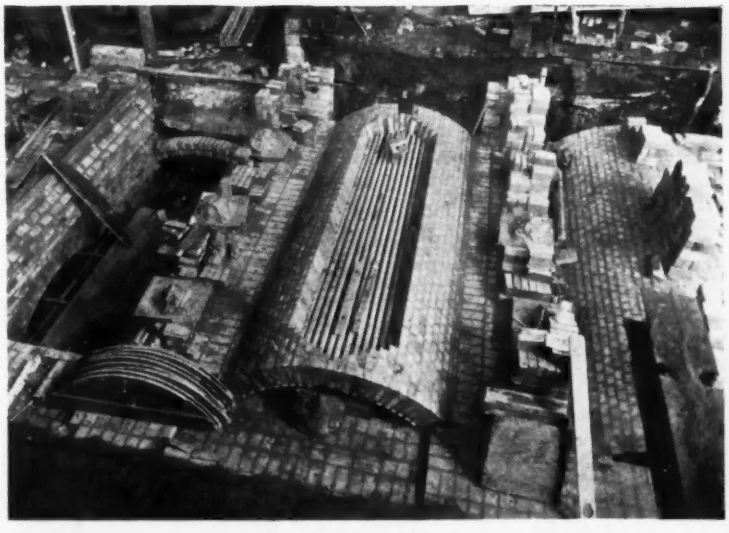


Fig. 6. Blue brick foundation arch under construction.

Fig. 7. Division walls and bottom of regenerator during construction.

resist the force exerted by the stoking machinery when discharging) but this brickwork would be free to expand inwardly to the expansion spaces.

Formerly, semi-circular arches had been employed but these have serious disadvantages. Mr. Muir Wilson has pointed out that a semi-circular arch is not stable to a locally applied load unless the packing between the arches gives support. He pointed out that a flatter arch had advantages in this direction, and that in this case full expansion allowances could be made in the 150 ft. of continuous brickwork along the length of the bench of settings.

A balance has to be achieved between the use of a very flat arch which is very stable to uneven load and the fact that the flatter the arch the greater will be the end force when this arch is heated and expanded. A compromise was effected by the use of a 100° arch.

Through the base of each bench of 15 settings passed the main flue which connected to the chimney at one end via a damper; the expansion of this flue would be approximately 9 in. (titleblock). A stepped expansion allowance was left at the centre of each setting and the flue was carried through arches in the division walls, also with clearance, and the end of the flue entered the chimney also through an arch so that all movements of the flue were compensated.

Producers, Combustion Chambers, Regenerators, and Retorts.

For the internal structure of the setting a survey was made of the temperatures prevailing at all levels of the setting from the foundations to the setting arch. Most of these were known almost exactly and others could be filled in by interpolation (Figs. 8 and 9). Generous expansion allowances in both dimensions were arranged in every course of brickwork up to the producer arch.

Up to this point all expansion allowances made could be greater than the calculated expansion of the brickwork in question, but above the producer arch care had to be taken with the retorts and cross walls. Being silica, the expansion

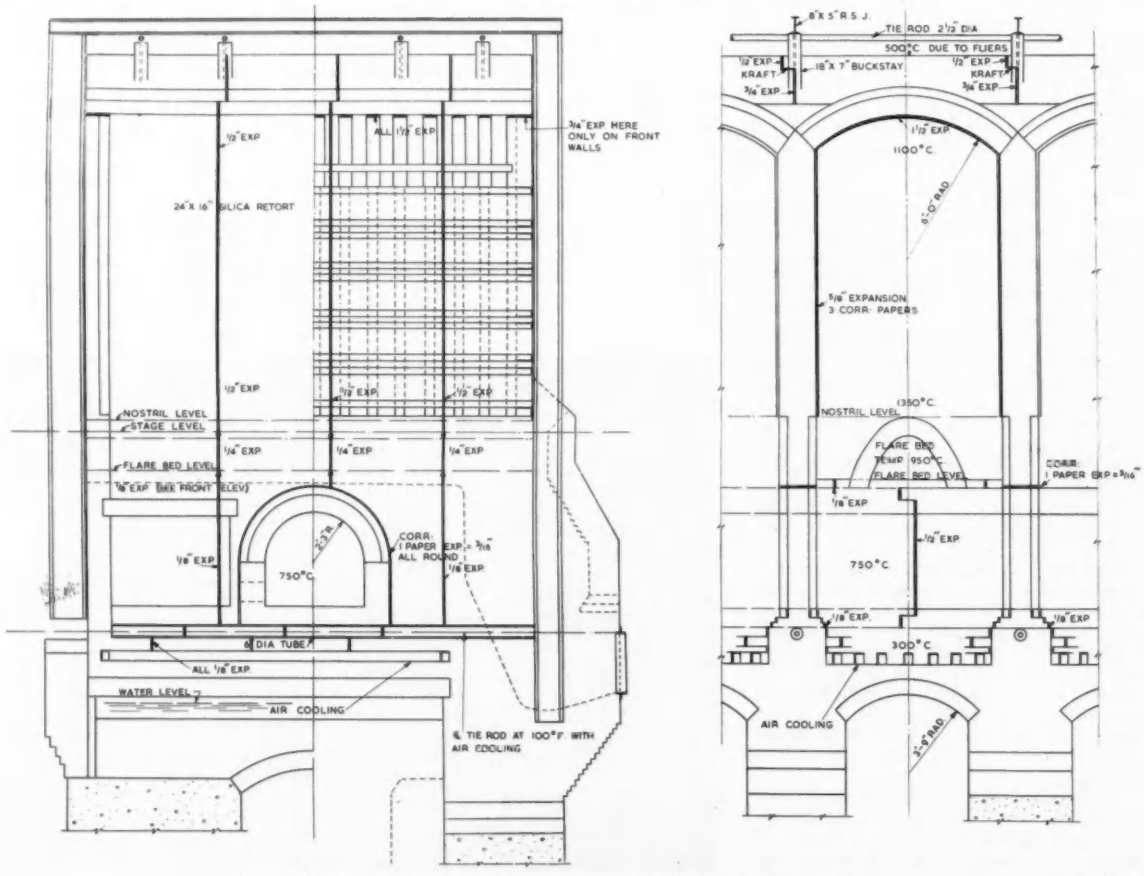


Fig. 8. Cross-section showing many of the expansion joints.

of these is greater, but it is imperative that the expansion spaces must not only close but the brickwork must tighten so that the retort is fully supported to resist the mechanical forces applied to it during charging and discharging.

Consideration must also be given to the fact that the large expansion of the silica retorts has to be considered in relation to the steel bracing of the setting. Above the producer arch

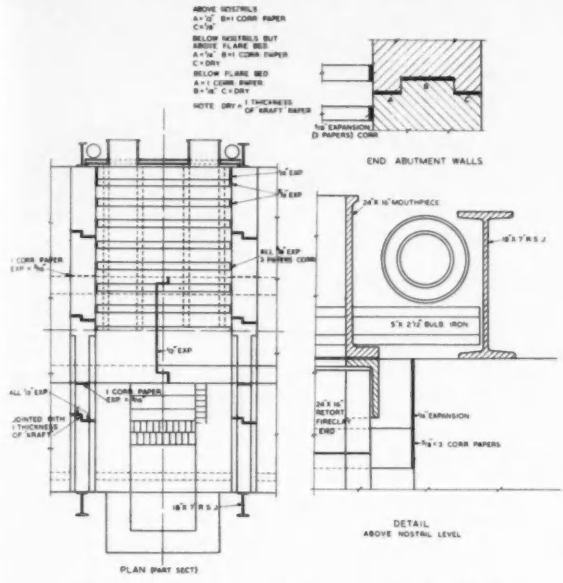


Fig. 9. Plan view showing the expansion joints.

the position is that: (1) There is a change of material from fireclay to silica; (2) approximately full allowance is being made for expansion in the dimension across the setting; (3) no expansion can be allowed in the dimension longitudinal to the retort.

So far as the author is aware, no setting has been built successfully with expansion spaces in the retort itself. Experimentally this was tried in the early days when silica was first introduced, but the expansion spaces did not close and a gas-tight joint was not made.

Dealing first, therefore, with the expansion in the direction of the retort, the movement to be dealt with is an increase of 2.9 in the length of the retort, and the retort does carry the cross walls along with it during the expansion. The effect of the retort movement on the steelwork was also surveyed. Quite obviously the retort steelwork must deflect under the load applied. The load applied to the buckstays is: (1) That needed to direct the expansion of the division walls inwards to their expansion spaces; (2) that required to support the mouthpieces and to apply end pressure to the retorts to maintain the gas tightness of the circumferential joints; (3) that needed to support the producer bracing.

The main load on the buckstay comes from item (2).

Calculations show that utilizing a stress well within the elastic limit of the buckstays an end force of one ton could be applied to each retort. Since the cross-sectional area of the walls of a retort is 234 sq. in. an end load of one ton would be equivalent to 10 lb. per sq. in., which is well within the crushing strength of silica. A load of one ton on the retorts appeared both a reasonable one for the buckstays and a safe one on the retorts.

From these figures the loading on the buckstays and the bulb irons can be calculated and also the deflections under these loads. These figures are as follows:

Maximum deflection of buckstay	... ...	0.5 in.
Maximum deflection of bulb iron	...	0.2 in.
Expansion of tie rods by heat	... ...	0.1 in.

To avoid over-stressing the buckstays the outward movement of the end of the retort should, therefore, not be greater than 0.8 in. However, the expansion of the retort would cause a movement of 1.45 in., and it was fairly obvious that some further compensation for this movement should be allowed. Since no allowance was made in the steelwork deflection for movements in brackets, etc., a temporary rig of two buckstays with their appropriate steelwork was made and these were loaded by hydraulic jacks to the stated load. The actual deflection was found to be 1.3 in. and the discrepancy was traced to the use of bulb irons which had been in use for many years and which had a greater deflection than calculated. Accordingly, the elasticity of the steel bracing was sufficient for the expected movement of the retort.

In later work where new steelwork was used, this additional compensation was made by inserting a bent steel washer between the bulb iron and the buckstay bracket, which collapsed at one ton loading. These were made by tack welding two bent washers to form a flat ellipse with the desired space between the two concave surfaces.

Dealing now with expansion across the setting, two expansion spaces were left at the two ends of the cross walls, each space being filled with three corrugated papers which should give $\frac{4}{5}$ in. space at each end of the cross wall. It was estimated that these spaces would be sufficient to accommodate most of the expansion in this dimension. This was estimated as follows:—

102 in. of silica at 1.3%	=	1.32 in. expansion
18 in. of firebrick at 0.6%	=	0.11 in. expansion
Total		1.42 in.

Final measurements after reaching working temperature indicated that these expansion spaces closed fully and gave a further expansion per setting of 0.25 in.

Dealing now with the vertical expansion, calculation would indicate that the firebrick division walls and setting arches would rise 1.6 in., whereas the silica setting plus the firebrick producer would rise 2.5 in. It was, therefore, necessary to cater for at least an 0.9 in. space between the top of the silica cross walls and the other end side of the setting arch. Actually, 1.5 in. space was left.

Heating Up and Operating the Setting

The settings were brought to working temperatures by our usual procedure and the whole process occupied seven weeks. The settings came up to heat very satisfactorily. Careful inspection of the retorts showed no evidence of distortion. A small amount of distortion was evident at the corners of the buttress walls and at the joint between the face of the setting and the division walls, but this was not excessive.

Fig. 10. Division wall after demolition of setting showing original bricklayers' construction mark.

The retort house has operated for several years extremely satisfactorily. Heats have been easy to control and the technical results have been satisfactory. The air cooling of the bottom tie rods and the setting base is still operating and has not required any attention as regards deposits of dust. After four years continuous work it became necessary to let the house down cold. Measurements of the length of the bench of 15 settings between buckstays under various conditions bring out the interesting point that a certain amount of expansion took place between the second and fourth year of work. The reason for this is not known. The shrinkage on cooling is also of considerable interest and the fact that after again coming to working temperature this dimension recovered almost exactly. Since the above work was completed two further retort houses have been reconstructed on similar lines and both are operating satisfactorily.

The deflection of the buckstays has been found to be rather greater than the calculated amount. This has been traced to the fact that during the heating-up period the cross walls expand and make contact with the division walls before completion of the expansion of the retorts. The remaining expansion of the retorts continued to carry the cross walls in an outward direction and this movement tends to move the ends of the division walls outwards against the buckstays. It would be possible to obviate this difficulty by slightly increasing the expansion spaces in the cross walls.

General Application

Although this work has dealt with the design of horizontal settings, similar principles can be applied to other types of carbonizing plant. Intermittent and continuous vertical retort plants with rectangular retorts are, perhaps, the most straightforward in enabling a design to be made which will cater for expansion in all directions. The expansion movements in the retort walls are in straight lines and the expansion spaces can be symmetrical. With the elliptical section vertical retorts the problem is more difficult.

With vertical retorts it has been our practice for some years to build the buckstays clear of the setting and to arrange for calibrated springs to be inserted between the four corners of the steel bracing and the buckstays. The purpose of these springs is to indicate the stress between the steel mattress and the buckstays. The compression on the springs is controlled by screw adjustment maintaining a pre-determined load on the bracing. A similar procedure is employed on coke ovens in that a spring in the form of Belle Ville washers is used between the buckstays and the tie rods.

Materials

There is one other aspect of this work to which attention should be drawn and that is the quality of the refractory materials used. Sampling a large delivery of firebricks or silica sections is a difficult operation. Testing of samples is a slow and expensive process, and obviously the satisfactory minimum number of tests is required. When these tests are completed, ability to accept or reject a consignment presupposes agreement between the buyer and seller of an accepted method of sampling and testing and an agreed specification. It is often considered that the adoption of a specification, such as has recently been prepared for the gas industry, calls for a large amount of sampling and testing to ensure that it is being complied with. Ultimately this need not necessarily be the case.

Most firms supplying silica and some of those making fireclay goods do carry out batch tests of their products regularly and rigorously, but there are others who rely on occasional external tests of unrepresentative samples. For satisfactory operation this may involve sampling at the seller's works before delivery. Although initially slow and cumbersome, this method does ensure that deliveries avoid off-loading and stacking to await approval.

So far, only sampling and testing to prove the quality of the material and its firing has been considered, but there is, of course, the physical examination to be considered for texture, shape, dimensions, and appearance, ironspots or cores. The presence of cores and ironspots may not always be harmful but usually gives rise to irregularities in expansion, and bricks suffering from this type of defect should not be accepted without clear proof that the defects do not have a detrimental effect on the 'permanent linear change' test. The tolerances in dimensions proposed in the new specification are greater than those allowed for in the previous schedule. Precision sizes of refractories are possible at a price. The greater the tolerance in dimensions the greater is the cost of building a satisfactory setting with minimum thickness of joints. In most cases, however, sorting into size limits and the blending of these sizes can result in a satisfactory structure with a minimum of brick cutting.

In the specification of clay-bonded silica bricks, a specific gravity clause is proposed. The conversion of quartz to cristobalite in this type of brick is sluggish due to the presence of alumina and the completeness of firing is assessed better by this type of test.

In conclusion, the author would like to make clear that he does not want to give the impression that the mere inclusion of expansion spaces will of necessity avoid or minimize distortion of carbonizing plant on bringing to working temperatures. To achieve this end a comprehensive and coherent overall design is required.

SMOKE ABATEMENT AND THE LAW—*From page 42.*

to a remarkable extent, and the report has been accepted so widely—if a little unwillingly in some quarters—that the way is being cleared not only for new legislation, which of course is not all, but for more determined activity all along the front. There are inevitably omissions and weak spots in the report—different perhaps for different people—but the important thing is the tremendous advance that is being made possible through the overall impression it has created. We must take care not to crab the whole in criticizing any detail.

Finally, if one may venture another warning, great though the advance in public opinion may be, it must be remembered that it is mainly in what is called responsible opinion—that is, the opinion of the small minority of people in responsible positions who, in time, are at first followed and then pushed on by mass public opinion. This process is now starting, but there is a very long way to go, and it is necessary for all who are actively concerned with the problem not to relax, but to redouble their efforts, whether it be in the field of technology, administration, or publicity and education.

EAST MIDLANDS EXPERIMENT

An interesting experiment was carried out last week at Brigg gasworks, Lincolnshire, by the East Midlands Gas Board in conjunction with the Fulham research laboratories of the North Thames Gas Board. Brigg has a small gasworks which is being closed down and linked up with a gas grid system now under construction. In the ordinary course of events the retorts where the gas is made would be allowed to cool down naturally, a process which takes a week or two, and would then be dismantled. In this case, however, in order to extend the industry's knowledge of the condition of retort walls under actual working conditions, it was proposed to 'quench' the retorts by pouring a large quantity of water into them. As some 30,000 gal. of water were likely to be used in the experiment the quantities of steam produced would be quite prodigious and the operation rather spectacular. The actual quenching process was to go on for only three hours, but at the end of 24 hours the retorts should be ready for inspection. The object of the experiment was to 'freeze' the retorts so that the refractory brickwork of which they are made could be examined in its normal operating condition—impossible after slow cooling as considerable changes take place before a low enough temperature is reached.

Babcock & Wilcox, Ltd., announce the fusion of the trading activities of two of their subsidiary companies, Spencer-Bonecourt, Ltd., and the Clarkson Thimble Tube Boiler Co., Ltd. The name of the former company has been changed to Spencer-Bonecourt-Clarkson, Ltd., and it will assume responsibility for all new business in Spencer-Bonecourt waste heat boilers, the Clarkson marine and industrial waste heat, oil, and gas-fired boilers and the new 'Autoheat' oil-fired domestic boilers. The Chairman is Captain (E) W. Gregson, formerly Chairman of Spencer-Bonecourt, Ltd., and Mr. S. W. Spurr, Managing Director of the Clarkson Company, becomes Managing Director.

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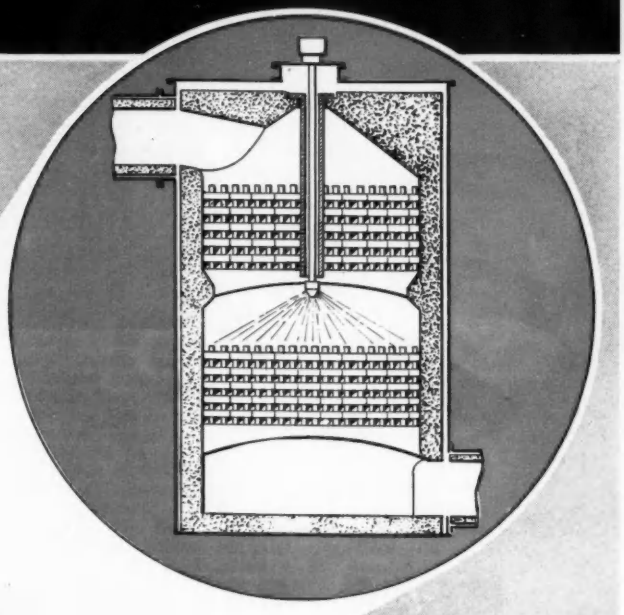

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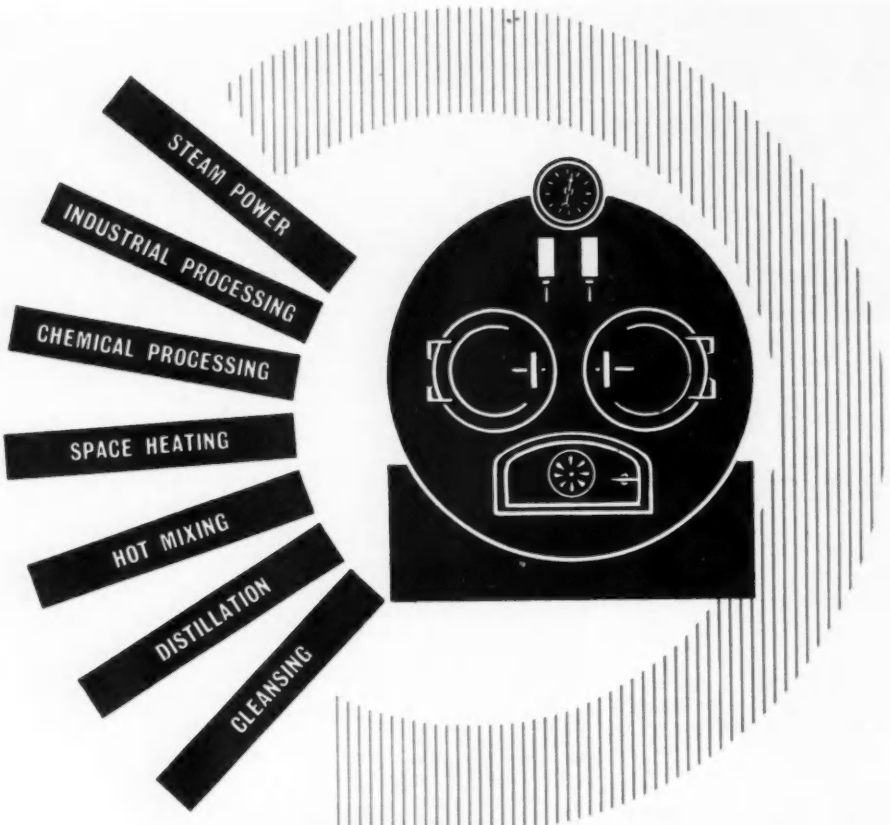
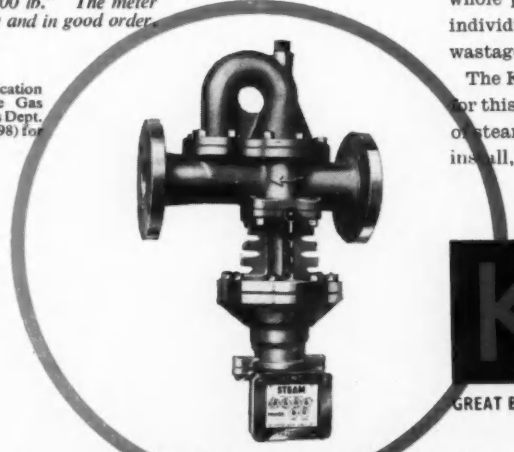


DOES STEAM COST TOO MUCH?

Striking evidence of the reliability of Kent RS/C Meters for recording steam consumption was recently supplied by Messrs. Harrison & Sons Ltd., Hayes, Middlesex. They state that a 2-inch RS/C "installed in 1933 had not been serviced in any way until March 1954. During this period, it has been in continuous operation and has returned to zero four times, the total weight of steam metered to date being 418,319,800 lb." The meter is still operating and in good order.

Write for Publication 195, or telephone Gas Industry Contracts Dept. (Luton 2440, Ext. 98) for an estimate.



THERE is a growing realization that steam used for processing can and should be made a direct charge on the manufacturing cost of a product. Simple metering provides an accurate record for establishing actual costs, determining peak-consumption places and times, forecasting future requirements, and estimating whether it would pay to improve existing steam plant and distribution systems. Equally important, it encourages economy throughout a whole plant or works. Once steam metering is installed, individuals and departments become aware that steam wastage on their part will no longer pass unnoticed.

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VOLUNTARY BRIGADES' LONG SERVICE

Awards for long and meritorious service in the Voluntary Brigades of the Tottenham Division of the Eastern Gas Board were made to four employees at the annual dinner given by the Board to ambulance and fire fighting personnel at the Tottenham G.A.S. Club at Willoughby Lane on March 25.

The dinner was attended by ambulance, fire and rescue squad members of eight gasworks in the Tottenham Division and the repair shops at High Road. Sir Harold Smith, who now makes this function one of his annual dates, expressed his pleasure at coming back to Tottenham once more. 'I don't think I need say why', he remarked. 'Looking round this room I see some of the men I knew at Tottenham 35 years ago. It is nice to come among friends and I am delighted to know you are still serving the gas industry and giving your valuable aid to the Voluntary Brigades'. He added a word of congratulation to the Barnet works team who won the National Gas Industry First Aid Trophy, adding to the honour brought to the Division in 1953 by a team from Tottenham, and said he hoped to see the Division win the trophy for the third consecutive time when the competition came along this year.

Mr. F. T. Brookes, Tottenham Division General Manager, presided and had the support, in addition to Sir John Stephenson, of several members of the Board, as well as his own Divisional officers. Mr. Brookes, in congratulating the Brigades on their good work, mentioned that the Board's St. John Ambulance members performed nearly 4,000 hours of public duty in 1954 and the number of recorded cases treated by the men was no less than 1,149. Looking at the large array of cups, shields and other trophies won by the ambulance teams, he described it as undoubtedly a gala year for the gas men.

A highlight of the evening, and one entirely unexpected by the recipient, was the presentation to Mr. Brookes of a gavel, in boxwood, the inscription bearing testimony to his keen and valued support of the Voluntary Brigades. The presentation was made on behalf of the men by Superintendent W. C. Squire, B.E.M., who expressed appreciation of the co-operation given by Mr. Brookes in furtherance of the Brigades' work.

Sir John Stephenson replied to the toast to the Board, proposed by Mr. P. J. Kedge, Divisional Accountant, and a toast to the visitors, expressed by Mr. W. C. Kincaid, a member of the Board, had response by Brigadier J. W. Hinchcliffe, D.S.O., Deputy Commissioner of the St. John Ambulance Brigade, London District.

Among the visitors, to whom a cordial reception was given, was Pensioner S. W. White, formerly captain of the Tottenham Gasworks Fire Brigade. A concert was given by West End artistes and was much enjoyed.

Sir Harold Smith, Chairman of the Gas Council, who formerly had a long association with the Tottenham and District Gas Company, pinning the silver medal of the London Private Fire Brigades' Association on Mr. E. C. W. G. Asser, a towerman at Leeside Chemical Works, in recognition of 20 years continuous service in the works fire brigade. On the right are Mr. H. J. Gilder, process shift foreman, and Mr. W. J. Mason, benzole still operator, also at Leeside Chemical Works, who qualified for the silver bar to the silver medal for 25 years service, and on the left is Divisional Officer H. W. Brant, a fitter at Willoughby Lane Works, who received a second silver bar to his St. John Ambulance Brigade silver medal, also on completion of 25 years service. As a member of the Tottenham (No. 91 Gas) Division of the St. John Ambulance Brigade, Mr. Brant last year performed 213½ hours of public duty. On the right is Sir John Stephenson, C.B.E., J.P., Chairman of the Eastern Gas Board, and on the extreme left Brigadier J. W. Hinchcliffe, D.S.O., Deputy Commissioner, St. John Ambulance Brigade, London District.

Bottogas, Ltd.

Shell-Mex and B.P., Ltd., have acquired Bottogas, Ltd. This company, with its predecessor, Spensers (London), Ltd., has for 19 years been engaged in the distribution of commercial butane as bottled gas for domestic purposes and in the sale of related appliances and fittings. At present the company is continuing to operate under its old name and on the same lines as before, but some changes in organization and methods will probably be made as time goes on.

The Board of Bottogas, Ltd., now consists of Mr. C. M. Vignoles, O.B.E. (Chairman), and Messrs. C. T. Brunner, F. A. Keeling, A. M. Mackintosh, O.B.E., R. J. Bressey, A. M. Macaulay, S. C. Green, and A. G. I. Anderson. Mr. A. M. Macaulay is the General Manager.

Maintenance Craftsmen's Wages.—Agreement has been reached between the Gas Council and the Confederation of Shipbuilding and Engineering Unions providing for an increase in wages of 4d. an hour for works maintenance craftsmen employed in the gas industry. The increase took effect on April 3.

COMPANY NEWS

COLONIAL GAS

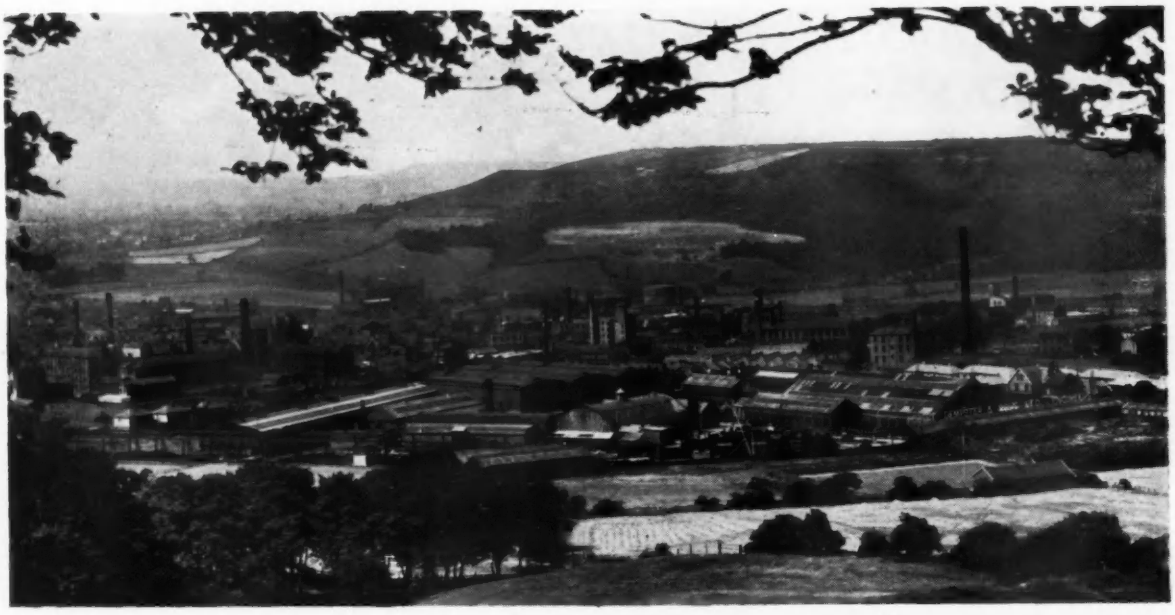
A cable from Melbourne states that interim dividends in Colonial Gas Holdings, Ltd., have been declared as follows: Preferred stock, 3%; ordinary stock, 3¼%.

BRITISH VACUUM CLEANER

The Directors of the British Vacuum Cleaner and Engineering Co., Ltd., recommend a dividend of 30% less tax on the ordinary issued capital of the Company in respect of the year to September 30, 1954, compared with 25% for 1953. Group profit for the year 1954 after all taxation was £99,265.

CORK GAS

The annual report and accounts of the Cork Gas Consumers' Company for the year ended December 31, 1954, show that after providing £15,000 for depreciation, £6,400 for mortgage debenture redemption, and paying an interim dividend of 3½% the balance of profit was £13,567. A final dividend of 3½%, making 7% for the year, leaves a credit balance of £10,285 to be carried forward.



This general view of the present-day Rose Mount Iron Works is reproduced from the end papers of the Centenary volume of Robert Dempster & Sons, Ltd.

One Hundred Years of Progress

Dempsters of Elland Centenary Celebrations

'The gas industry has a lively appreciation of the value of the work of contractors such as Dempsters of Elland and I wish the firm every prosperity as it passes forward into its second centenary of useful life.' Sir Harold Smith, Chairman of the Gas Council, sent this message to Robert Dempster & Sons, Ltd., Elland, who held a centenary celebration dinner at the Queen's Hotel, Leeds, on March 25. It was attended by members of the Manchester and District and the North of England Sections of the Institution of Gas Engineers, whose spring meeting, held earlier in the day, took the form of a visit to the North Eastern Gas Board works at Tingley. This was only one event in the centenary celebrations. In April, the firm will provide an outing to Blackpool for employees and their wives and friends, and a gala day in June.

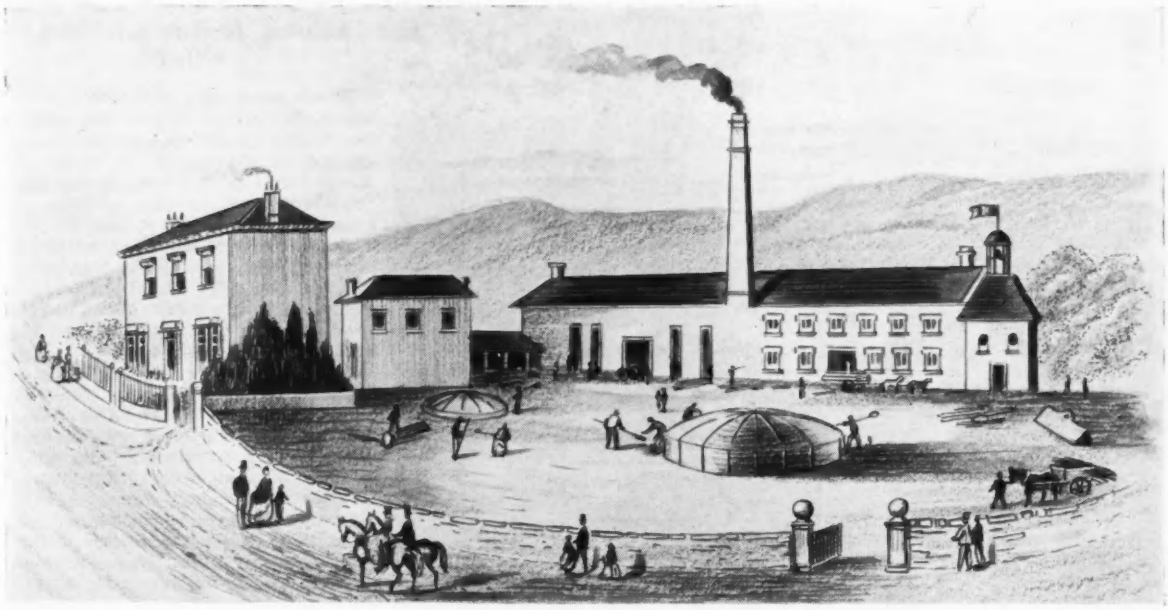
Among the guests who attended the centenary dinner were: Mr. E. Crowther (Chairman, Northern Gas Board), Dr. R. S. Edwards (Chairman, North Eastern Gas Board), Mr. J. H. Dyde (Deputy Chairman, Eastern Gas Board and Past President of the Institution of Gas Engineers), Mr. G. E. Currier (Deputy Chairman, North Eastern Gas Board and Past President of the Institution), Mr. A. Henshall (Deputy Chairman, North Western Gas Board), Mr. J. H. Johnston (Chairman, Manchester and District Section), Mr. W. R. Garrett (Chairman, North of England Section), Mr. W. A. Evetts (Chairman, Eastern Section), and Mr. W. B. Claridge (Chairman, South Western Section, I.G.E.).

Mr. G. E. Currier, who proposed the toast of Robert Dempster & Sons, Ltd., expressed on behalf of the representatives of the gas industry their felicitations to the Company on the completion of a not-out century and good wishes to their Managing Director, Mr. B. C. Morton, who had served the Company for nearly half a century.

The gas industry had good reason to be grateful to plant manufacturers for they had played an indispensable part in the technical progress of the industry. They were, fortunately, a restless body of people, never satisfied that the plant they were producing was the last word in that particular process. They had spent, and continued to spend, large sums of money and much time and skill in the investigation of new techniques and the improvement of old ones. This research had been of technical and commercial advantage to both sides of the industry and, on the supply side, they had always been ready to provide facilities for experiments. Many developments had been the result of collaboration between gas engineers and contractors. Robert Dempster & Sons, Ltd., had played their part in this development. Indeed, the firm sprang from the gas industry; their founder was the Manager of the Elland gasworks. Born in Cupar, Scotland, in October, 1828, he started work with a meter manufacturer at the age of 15. His early marriage no doubt added necessity to ambition, leading to an appointment as meter inspector at Dundee, and later as department foreman at the Phœnix gasworks, London. Failing health caused him to seek other employment and brought him to Elland as Manager of the gasworks in the early 1850's. Soon he began to undertake retort building contracts and in 1855 established the firm to carry out this work.

From an advertisement dated 1866 they could see how rapidly the business expanded and the wide range of plant manufactured, including firebrick retorts claimed to last 10 to 12 years. An interesting development was the offer to operate gasworks under contract to produce at 2s. 6d. per 1,000 cu.ft. gas of 15.0 candles illuminating power. That was good pioneering work.

From their earliest days Dempsters of Elland had been ready to apply their knowledge, skill, and plant to the manufacture of new products. They pioneered the use of spirally-guided gasholders and were one of the original licensees of the M.A.N. waterless gasholder. The erection of gasholders was still one of their major activities. They had recently completed holders of various sizes for nine of the 12 area boards, including one of 5 mill. cu.ft. in Scotland. Another principal interest was the construction and installation of purification plant. They introduced the dry seal which was now universally used in oxide purifiers. Since the war, they had introduced into this country the German Gasechnik Tower purification system. 'I feel now, as I did when I first saw the process in Germany two years ago,' said Mr. Currier, 'that it provides one of the most promising solutions to the growing problem of gas purification. It is a completely mechanized process, eliminating much of the arduous and obnoxious labour associated with the traditional box type purifiers; the cost is no greater and indeed the capital cost is less. The North Eastern Gas



Rose Mount Works in 1855, reproduced from a drawing published in the historical review of Dempsters of Elland on the occasion of their Centenary.

Board was happy to co-operate with Dempsters by granting facilities for the erection of a pilot plant at Elland gasworks.'

Dempsters had always been a firm of character and the gas industry had reason to respect their insistence on working up to a standard, rather than down to a price. The merits of their gasworks plant was well known and they had carried out innumerable jobs for a wide variety of industries. Their reputation for mechanical handling plant was world-wide. During 100 years, the Company had seen many fluctuations in the state of industry. They had lived through recessions when they had had to tighten their belts, and through depressions when they had had no belts to tighten, but Mr. Currier doubted if they had ever got into the state known as panic. Robert Dempster designed and made a gas meter in 1854, but his successors had not made meters for many years. Mr. Currier said he wondered whether they were wise to retire from that market. Dempsters had always been a family concern in every sense; sons followed fathers into the shops, and once in, were in for life. Some 20% of the employees had 25 years' service with the firm—an enviable record. The tradition established by Robert Dempster for producing and marketing goods of the highest quality had been ably sustained by the present Managing Director, Mr. B. C. Morton.

MR. B. C. MORTON (Managing Director, Robert Dempster & Sons, Ltd.) thanked the Manchester and North of England Sections of the Institution for allowing the centenary function to be linked with their joint visit to the Tingley works of the North Eastern Gas Board. Dempsters were justly proud of the number of engineers who received their early training at the Rose Mount works and who had moved to successful careers, not only in the gas industry, but in other industrial fields. He was pleased to welcome quite a number of these worthy prodigies; also, representatives of another important section of the industry—the contractors, sometimes maligned, but still very necessary. It was 48 years since he started at Rose Mount. In 1907 a labourer received 18s. 10d. a week for 56 hours, whereas today he received 132s. 10d. minimum for a 44 hours week, plus piecework and other bonuses.

'We began business in the days of the Crimean War,' said Mr. Morton. 'To our regret, we cannot claim to have helped in providing the light for Florence Nightingale's lamp.' However, Robert Dempster's self-chosen trade mark—a gas lamp with its motto 'Dare Lucem' (Let there be Light) was appropriate at that time. Now the motto assumed an ethical significance, and unless such a company was prepared to shed the fullest contribution of enlightened advancement within the industry it served, its existence was unworthy. They took no little pride that whereas many a reputable firm had lost individuality through the financial changes in its constitution, they were still a family business with the present Chairman a grandson of the founder. By combining modern methods with the tradition of family business they preserved something which should be cherished in this country, and which to his mind was a great asset to the trading community of the nation.

Both sides of the industry faced an ever increasing spiral of wages. A long looked for period of stability of trading conditions was not yet in sight; inflation was still apparent; coal was scarcer and dearer; and there was need to employ effectively all resources to avoid the fear of being priced out of existence. They were living in a supersonic age and in a delicately poised world. Science was making repeated advancements with nuclear energy and the piercing of sound barriers. They were at the gateway of a complete revolution in everyday life and in industry. They depended for their standards of life on exports and on their ability to produce. It was imperative that they should meet the intensive competition abroad. What contribution could the gas industry make? It could not make direct exports, unless it be coke, which was becoming more and more necessary for home demands both as a fuel to replace coal and to create smokeless zones.

They must, however, produce gas for industry, and even domestically, by whatever process, at an economic price, and to do this they needed to harness their best technical brains along a clearly defined road of progress. In that direction, manufacturers of gas and the contractors needed to play a co-operative part in helping to make a vital and necessary contribution. To the gas industry of 1955 he would say that the climax was still the future, the zenith of achievement was ahead, the best was yet to be.

MR. J. H. DYDE, who gave the toast of the Manchester and District and North of England Sections of the Institution, said the Manchester Section was the more venerable. As a Yorkshireman its name and its area had puzzled him quite a lot. It seemed to savour of capitulation to the Lancastrian, but on reflection it was a case of 'hands across the Pennines for the gas boys.' The North of England Association started in 1877 with a subscription of 10s. 6d. and did not raise it until 1954. Mr. Dyde went on to say he never failed to experience a sense of humility when he travelled to the northern industrial belt of England covered by the two district sections of the Institution.

Here there were men who had constructive genius, men who got things done, who had developed an engineering tradition. Many eminent engineering firms raw materials of reasonable availability and price-which will gasify?'

Already the spirit of enterprise was abroad; at Partington things were

Four principal speakers at the Dempster Centenary Dinner—Mr. J. H. Dyde, Mr. G. E. Currier, Mr. B. C. Morton (Managing Director of Robert Dempster & Sons, Ltd.) and Mr. H. Johnston (Chairman of the Manchester and District Section of the Institution of Gas Engineers.)

in the gas industry had works in the area.

'It is not surprising,' he continued, 'that in this atmosphere the two associations have been a cradle and a nursery for so many presidents of the I.G.E. Here are names impressed on the annals of the Institution and the industry—Thomas Newbigging, Charles Wood, Samuel Tagg, Charles Stuart Shapley, William Moncrieff Carr, George Dixon, Edward Crowther, R. E. Gibson, Frank Tarratt, Thomas Hardie and George Currier, also, I believe, not a member of either association, Sir Frederick West. May your associations go on producing men of their character and ability. Within your associations, and among the many contractors with whom you live, to one of whom we pay special tribute this evening, there is a great deal of accumulated skill and latent resources which needs must emerge to resuscitate our industry today. The position I feel is such that only keen enterprise both on the supply and the contracting side can see us through this uncertain phase of our development. We have experienced such phases before and the challenge has been met.'

Supplies of coal of the sort on which they had built their production methods and their economy, appeared to be no longer available in the quantity or at the price that spelt any hope for the future. Perhaps the Beaver Report, when interpreted in terms of legislation, would change all that. 'Do we wait, Micawber-like as we have done for so long, for something to turn up, or do we go all out to develop processes which will use any and every class of coal for gas making, indeed any other

'accelerating,' at Whitehaven they were 'reforming' at York they had got 'cracking' in another sort of way. That was just a beginning, just a shaking off of the fetters that a traditional policy seemed to bind. Their associations and their engineering skill were going to play a big part in the awakening.

The final speech of the evening was that of MR. J. H. JOHNSTON, who commented on the value of the educational work of the Institution, particularly in providing facilities for the tuition and training of young men who entered the industry, as well as the opportunity for technicians of all kinds to discuss problems. This collaboration among technicians had proved of great value. He added his congratulations to those which had already been conveyed to Robert Dempster & Sons, Ltd., and their Managing Director, on having completed their first century and wished them prosperity in the future.

Industrial production in January was 4½% above that for January last year, and was the highest yet recorded for that month. The Central Statistical Office index of January output for all industries was 132-133, compared with 127 in January of last year. Between April and October of last year the average weekly earnings of all manual workers rose by 3%, or 5s. 3d. The figure for October was the highest ever recorded, earnings being two-thirds higher than in April, 1947, although the weekly wage index showed a rise of only 45% in the same period. In October the average weekly earnings of manual workers in manufacturing industry were £8 10s. 10d. compared with £8 5s. 5d. in April.

London Juniors see 'Met.' Office

It was a sparkling late-winter's morning when thirty members of the London and Southern Junior Gas Association left London for the country on March 16. The sun shone and at last it looked as if the weather had got tired of being unpleasant. But the London Juniors had first-hand information to the contrary. For they were visiting the meteorological office at Dunstable—the national centre for the forecasting service of this country—who had put out this warning: 'The cold weather is returning with a northerly wind.'

As soon as they assembled, the party was given a short talk and then divided into two groups for escorting round the station. They were told that the establishment was originally set up there in 1940 as an emergency measure. There were four sections: The forecasting division; the forecasting research division, which devoted its time solely to research into forecasting problems; the observations and communications division; and finally the meteorological communications division—the operational section.

One of the chief objects of the research division was to try to extend the forecasting time. They did not claim to be able to forecast in the ordinary way for more than 48 hours ahead.

A big staff of radio operators is maintained at Dunstable; the station has to collect information over a very wide area. A chart of the whole of the Northern Hemisphere is drawn there twice a day. The London Juniors learned of the world meteorological organization, said to be one of the oldest, if not the oldest, of such organizations. All countries co-operated in this, 'even those behind the iron curtain'.

In recent years, another method of communication had been developed for use by the meteorological service—the teleprinter network. There were between 180 and 200 meteorological stations in the British Isles, all of which were linked directly or through group centres with Dunstable.

The parties were shown how all messages received or sent were printed in groups of five figures. The figures were symbols in an international code; thus, as the visitors looked at an operator receiving a message from Kiev on to the typewriter, they knew it meant precisely the same here as it did in Russia. Another facility they saw was the reception and despatch of weather-chart pictures by wire.

Finally, one of the forecasters spoke informatively on his job and answered questions on how the gas industry benefited by forecasting. He answered criticisms about inaccurate forecasting: 'The truth is,' he said, 'that the weather forecaster is a scientific adviser. He is advising upon what are the most likely experiences. Compared with any other scientific or professional adviser, the standard of accuracy is very high. Don't think of the "met" office as "the people who *ought* to know what is going to happen".'

A Joint Visit to Tingley Works

The close liaison that exists between the Manchester and District Section and the North of England Section of the Institution of Gas Engineers was made manifest on March 25, when nearly 250 members sat down to luncheon in the Town Hall, Morley, and afterwards visited the Tingley works of the North Eastern Gas Board. The Tingley works occupies the site of a disused colliery and coke oven plant covering approximately 46 acres. It was planned, prior to the nationalisation of the gas industry, by the United Kingdom Gas Corporation to supply gas at high pressure into the grid of the West Yorkshire Gas Distribution Co. When the works was vested in the North Eastern Gas Board in 1949 work on the foundations for the carbonizing plant was in progress. The first half of the carbonizing plant was put to work in 1953 and the first section of the second half in February this year. Full information about the Tingley plant and buildings has already been published in our pages.

MR. H. JOHNSTON, O.B.E., Chairman of the Manchester and District Section, presided at the luncheon provided by the North Eastern Gas Board. Among those present were: Dr. R. S. Edwards (Chairman, North Eastern Gas Board), Mr. E. Crowther (Chairman, Northern Gas Board), Mr. W. R. Garrett (Chairman, North of England Section), Mr. G. E. Currier (Deputy Chairman, North Eastern Gas Board and Past President of the Institution of Gas Engineers), Mr. W. A. Evetts (Chairman, Eastern Section), Mr. W. B. Claridge (Chairman, South Western Section), Colonel W. M. Carr, Mr. A. Henshall, Mr. A. McDonald, Mr. W. S. Hubbard, and several members of the area boards.

'Times Have Changed'

MR. H. JOHNSTON, giving the toast of the guests at the luncheon, recalled that when Mr. Crowther spoke at the meeting held at Newcastle he expressed the opinion that there would not be many more works like those at Howdon and Tingley and he was in entire agreement with him. Times had changed. The gas industry now had to face the possibility of changes that might be forthcoming from legislation based on the Beaver Report.

MR. E. CROWTHER said this was a meeting to which engineers had looked forward with a great deal of wishful anticipation because it gave the opportunity to express appreciation of the good relationship that existed between the Morley Corporation and the North Eastern Gas Board. All present were directly or indirectly, and in a very large measure, spending the greater part of their energies in the service of the gas consuming public in various parts of the country. Some did so directly as contractors, other than as suppliers of gas, but all were in a great public service which, he believed, gave good value for money. Unless they did so, he was sure the people of Yorkshire would express their opinions with characteristic vigour. The works at Tingley would prove to be an important source of supply of smokeless fuels which would be needed in increasing quantities.

MR. W. R. GARRETT, who also replied for the guests, said the district sections of the Institution of Gas Engineers were certainly encouraged when the gas boards took such an active interest in the proceedings. The North of England Section was pleased to join in that gathering, particularly as the Manchester and District Section was the oldest of the district sections, while the North of England was one of the youngest (although it incorporated the North of England Gas Managers' Association, founded in 1877). Many excellent technical papers had been presented to the Manchester Section, of which he wanted to refer to two. One was given by Thomas Newbigging in 1888, entitled 'Gasholders without upper guide framing' in which he stated his faith in the gasholder then known as the Gadd and Mason and today known as the spiral gasholder. While all knew that guided gasholders in those days were extremely heavy, Mr. Garrett still thought Newbigging was a little optimistic by claiming an estimated saving in weight of 50%. However, people in that area had sufficient confidence to install the first spiral gasholder in Northwich in 1890 and endeavoured progressively to maintain the record for size by the 700,000 cu.ft. at Widnes in 1893 and a 1 mill. cu.ft. again at Widnes in 1907. Incidentally, the Newcastle and Gateshead Company took the honour from them in 1908 with a 3,500,000 cu.ft. holder, followed by Manchester which in 1912 went to 5 mill. cu.ft.

The second paper of note to which Mr. Garrett referred was that by Nicklin and Redman, a year ago, when they dealt with an increased throughput of approximately 50% more coal in continuous vertical retorts. Was history repeating itself? Certainly the 50% increased coal throughput and the faith in re-cycled gas seemed to hark back to the justifiable faith in the spiral gasholder of 1888. The Manchester and District Section was lucky in that the Section covered more than one gas board area as this gave better opportunity for the interchange of technical information and ideas.

DR. R. S. EDWARDS, in giving the toast of the Borough of Morley, after referring to the development of the Tingley plant, mentioned that the new North Eastern Gas Board showroom in Bond Street, Morley, would be open and ready to give service in about a fortnight's time. 'It is an advanced showroom both in conception and design' he added.

ALDERMAN JOSEPH RHODES, J.P. (Mayor of Morley), replied.

The North Eastern Gas Board entertained the visitors to tea after the inspection of the Tingley works. MR. W. S. HUBBARD and MR. J. M. MCLUSKY expressed the thanks of the company. MR. A. MCDONALD replied for the North Eastern Gas Board.

Oxford's New Gasworks

Contractors have started work on Oxford's new gasworks on the Cowley site. This was announced by Mr. G. L. Perkins, of the Southern Gas Board, at the annual dinner of the Oxford and District Gas Undertaking in the Carfax Assembly Rooms, Oxford. The work which had been done was the preparation of the site for the excavations for the foundations of a gasholder. The work is expected to take about six months. By January of next year it is hoped to start erecting the holder. Mr. Perkins said this new development meant they would eventually have a supply of gas in Oxford which would be second to none.

It had always been a delight to him to be associated with the gas industry. It had been pleasant to observe the many developments and improvements which had taken place, and to notice the excellent spirit which prevailed at all levels. Mr. Perkins stressed the importance of the fuel and power group in the country, and said it was the foundation on which British industry stood. He spoke of the way in which the industry had directed its efforts towards reducing the cost of production, improving labour conditions, making economies in capital charges, endeavouring to get better distribution and consumer service, and expanding scientific research and its practical application.

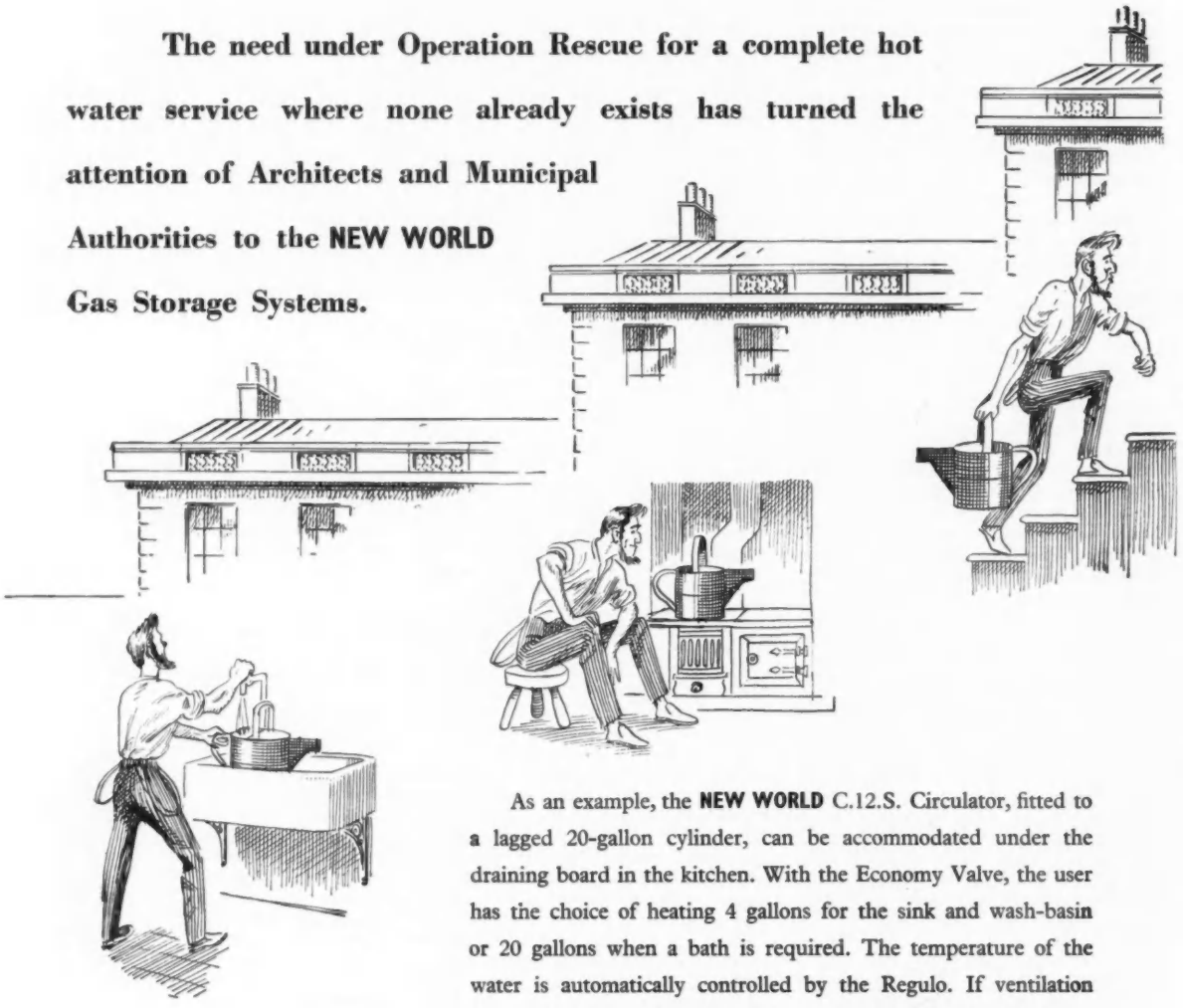
Mr. S. C. Bentley, Engineer and General Manager, Oxford, proposing the toast of the guests, recalled that their annual dinner had now been running for nine years. It was interesting to note that the number of their guests tended to increase. He said the Northern and Central Divisions were now amalgamated, and he congratulated Mr. F. G. Symon on his appointment as General Manager.

Mr. Bentley referred to the deaths of Mr. A. Tran, the former Divisional Manager, and Mr. Brown, the manager at Therm House. Such men were not common, and Oxford and the Board were poorer for their passing.

Among those present were Mr. S. E. Whitehead, Deputy Chairman, Southern Gas Board; Mr. F. C. Rea, Chairman, Southern Gas Consultative Council; Mr. S. V. Smith and Mr. G. L. Perkins, members of the Southern Gas Board; Mr. T. E. D. Mason, Secretary, Southern Gas Board; Mr. F. G. Symon, Divisional Manager, Combined Central and Northern Divisions, Southern Gas Board; and Mr. A. W. Brown, Group Manager, Reading.

NEW WORLD TO THE RESCUE

The need under Operation Rescue for a complete hot water service where none already exists has turned the attention of Architects and Municipal Authorities to the NEW WORLD Gas Storage Systems.



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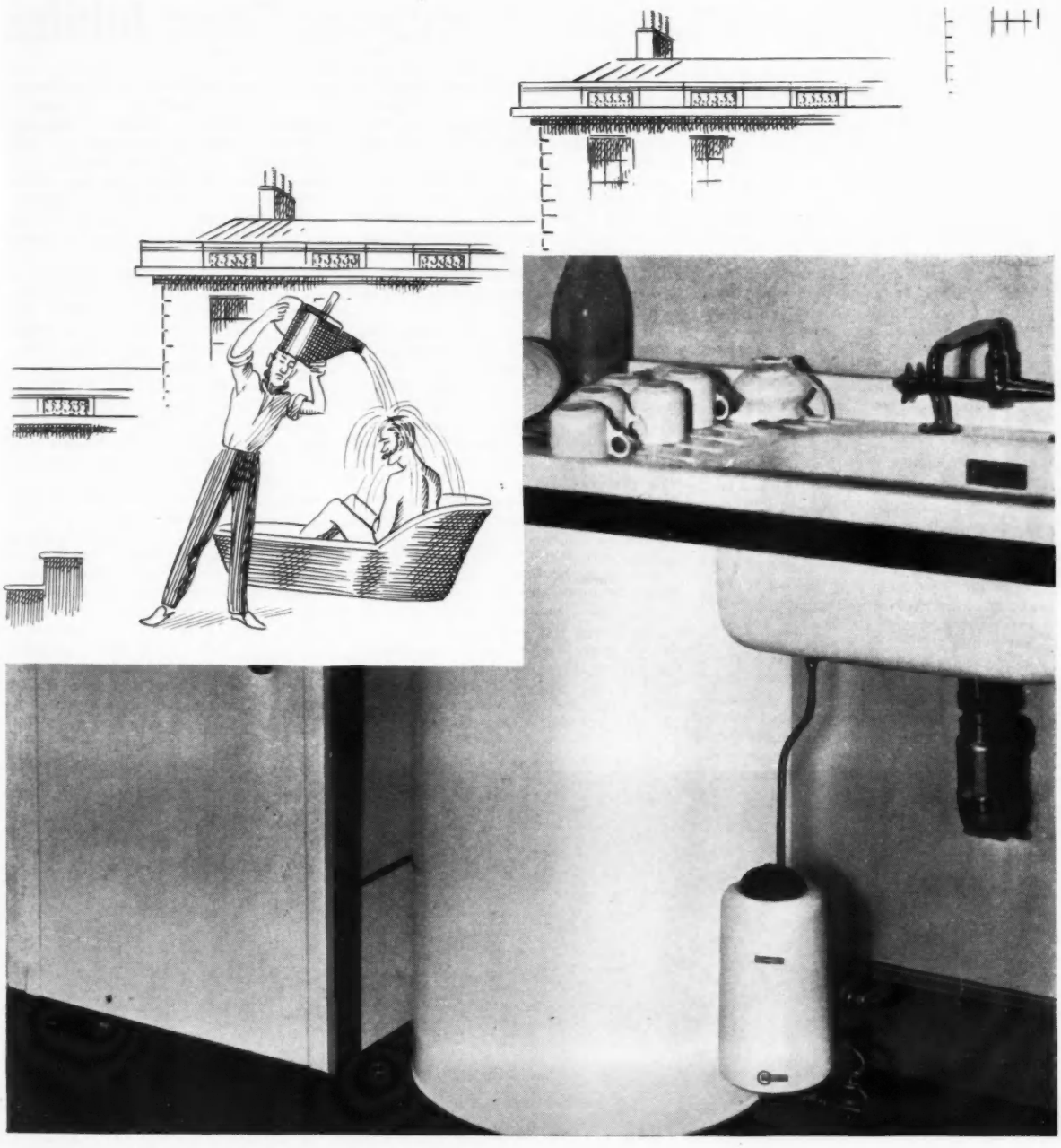

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Scottish Eastern Juniors Celebrate Their Jubilee

The Scottish Junior Gas Association (Eastern District) celebrated its Jubilee on March 18 with a dinner at the George Hotel, Edinburgh, at which about 110 members and guests were present. Mr. Stirling G. Melville took the chair. Of this Association the Centenary Number of the 'GAS JOURNAL,' 1949, says:—

'The Eastern District was founded under the Chairmanship of Mr. Walter Ralph Herring, at that time Engineer and Manager at Edinburgh, and Mr. H. H. Gracie (Edinburgh) was also one of the founders. While there have been no highlights in the life of the Association there has always been a large membership of keen members who turn up regularly at all meetings and outings and who are always willing to take part in what are invariably interesting discussions after papers have been presented.'

Strength in Rank and File

MR. T. R. CAMERON (Past President), in proposing the toast of the City of Edinburgh, said that he wished to do so because of the close ties the city had with the Association and because it was the Scottish capital, and Edinburgh was chosen to represent all the local authorities with which the Association was connected. He hoped that it would be noted when the evening was over that the first and last toasts were proposed from the body of the room. That was a reminder that although the brightness of the Junior Gas Association depended on the President's table, the true strength of the Juniors depended on the rank and file.

Edinburgh first saw the light of gas on March 4, 1820, and those early days saw Edinburgh with four gas companies, each struggling relentlessly for the favour of the citizens. They rivalled in winning business from each other and attributing leaks and smells to each other. That expensive competition was as natural to those four gas companies then as the competition between the four fuel and power industries was today. The four gas companies became two by 1840, and in 1888 they were bought by the Edinburgh and Leith Corporations, later in 1920 to become the Edinburgh Corporation Gas Department when Edinburgh and Leith were conjoined. The decision to buy the gas companies was not an easy one for the Corporation, for as early as 1875 a committee advised that 'keeping in view the probability of an improved system of lighting in the near future by electricity or some other new scientific method, the committee cannot recommend that the Council should take over the gas company at present.'

Gas Lighting in 1995?

So 80 years ago public opinion was being influenced by forecasts of new forms of power and energy just as today a lot of false optimism existed about the use of atomic power in the near future. Yet despite the findings of 80 years ago, Edinburgh found recently that if it continued replacing gas with electricity for street lighting at the present rate there would still be gas lamps in Edinburgh in 1995.

One of the early gas engineers in Edinburgh was Robert Mitchell. Although preceded by other engineers he was the first to have gas manager status; for many years the Company was run by John Kippen Watson, who was Treasurer and Manager. In 1897 Mitchell was succeeded by Walter Ralph Herring, who built Granton gasworks; he was one of the original members of the Association and helped in its formation. A. Masterton, the first President, followed Herring and he in turn in 1921 was followed by H. H. Gracie, who was the last of the engineers and managers to have a direct link with the building of Granton. In 1933 J. Jamieson took up office, again to be followed by Mr. D. D. Melvin. The present occupant was Mr. D. Beavis. He said it was a pleasure to the Association to have both Mr. Melvin and Mr. Beavis present.

The city was represented, he continued, by Bailie Bruce Russell, a Director of Johnson and Philips, convenor of the Lighting Committee, and a Governor of the Heriot Watt College. Bailie Bruce Russell was a member of the Health Committee and the city could pride itself in its past achievements. Edinburgh was once associated with such vile stenches that it was reported by a visitor that 'walking the streets of Edinburgh at night was pretty perilous and a good deal odoriferous.'

Whale Oil Lamps

BAILIE BRUCE RUSSELL, responding, said that the proposer of the toast was author of an excellent paper on the history of Granton's gasworks. In his paper he mentioned 'at least two gas companies continued to exist prior to 1888, no doubt the existence of two gas companies helped to keep the price of gas low.' A number no doubt wished the same happy condition existed today.

Prior to gas lighting in Edinburgh, streets were lit by means of oil lamps. A minute of the town council revealed that whale oil was used and that special responsibilities were placed on the appropriate officials in charge of the street lighting to see that the oil levels were maintained in the lamp containers, as sailors used to climb the lamp post and drink the oil.

The author also mentioned in his paper that notwithstanding dire prophecies in the early days of Edinburgh street lighting, other forms of lighting might eventually supplant gas as a means of illumination. A considerable number of Edinburgh streets were still lit by gas. Unfortunately, from their point of view, Edinburgh Town Council on February 3 this year gave approval to a scheme by which electric lighting for the whole of the City was to be completed in approximately 14 years.

DR. H. B. NISBET (Principal, Heriot-Watt College), in proposing the health of the gas industry, said it had had a long and distinguished history since William Murdoch began in 1792. Advances in technology were all adding to efficiency and were leading up to the day of complete gasification. He was pleased to see many of his old pupils, and was always pleased to see the friendliness and good fellowship in the industry and its associations. He wished the industry success in the future.

Great Names Recalled

SIR HAROLD SMITH (Chairman, Gas Council) thanked Dr. Nisbet, and made comparisons of 1905 with today. It was at that time carbonizing 14½ mill. tons of coal a year compared with 27 mill. tons last year. It was making 175,000 mill. cu.ft. of gas as compared with 503,000 mill. now. He recalled the great names of 50 years ago—Livesey, Carpenter, Corbet Woodall, and W. R. Herring in Edinburgh. In 1905 it was an engineers' industry, although in 1903 the Gas Light and Coke Company organized a Sales Force. The S.B.G.I. was formed in 1905. Sir Harold continued that the main object at the moment was to reduce the demands on the National Coal Board, and to that end research was going on into complete gasification, methane drainage, butane, propane, and gasification of oils. Atomic generation had not become a threat, as yet, of cheaper electricity, and meanwhile the gas industry had the possibilities of natural gas to cheapen therms and the present consideration being given to import liquid methane. He concluded by saying that now, as never before, it was important for the industry to pull together as a team.

MR. W. K. TATE (President of the Institution of Gas Engineers), in proposing the toast of the Scottish Junior Gas Association (Eastern District), said it was six months since he had attended the Jubilee Dinner of the Western District. The place of the industry was hardly won, and would be just as hard to maintain, and the future must lie in the hands of the juniors since, while the seniors could plan and could launch a ship, it was for those who then took over to ensure success and improvement.

Unconventional Outlook

The Association had been founded at a time when the gas industry was experiencing one of its periodic and major re-orientations. Just such another change had to be faced today with the re-assessment of production methods, of markets and of the relative importance of their products. At such a time the value of youth, with its resilience, its bright and perhaps unconventional outlook and its enthusiasm was immeasurably great, and on their future work all might depend.

The past also had its lessons and its merits, and he regretted the apparent tendency for the young man sometimes to rely a little too much on what he thought should be done for him rather than endeavouring to surmount obstacles

for himself. Nothing was worth having that had not been earned, and earned by hard work, coupled probably with some discomfort and disappointment. Knowledge gained that way would never be lost, and would carry with it a wider and more tolerant outlook on the strivings of those whom they would one day regard as juniors.

MR. DAVID ELGIN, President of the Association, replying, said he hoped the present generation would be able to endow the future with the same spirit as had been handed down for 50 years. He was convinced that gas could command a future in every way as great as its past. There was a readiness in each generation to draw on the experience of the last and to encourage the next. To that tradition associations owed their existence, but they were proud of the belief that they played some part in maintaining it. For the right sort of rapid but considered progress in the industry, harmony between generations was an essential thing so that any situation could be met with the approach it demanded; either brash eagerness or mature consideration.

MR. J. C. MACDONALD (Vice-President), in proposing the toast of the Past Presidents, said that the history and character of the Association had been influenced by the example set by the Past Presidents, and if proof were needed of the leadership and energy shown by office bearers of the last 50 years, they would only have to consider their high membership in relation to the small and lightly populated area in which they operated. He paid tribute to past secretaries, on whose efficiency they relied for the smooth conduct of their affairs. They had always been fortunate in having capable secretaries.

MR. SYDNEY SMITH (Chairman, East Midlands Gas Board, replying, said his year of office as President took place 20 years ago, and the recollection brought many pleasant memories. The Junior Gas Associations had always fulfilled a necessary function in the overall set-up of the gas industry, because they formed an important part of the training ground for men who would occupy the senior technical and administrative positions of the future.

The gas industry was steeped in the tradition of public service; of doing a job for the job's sake because of its all-absorbing interest and ever-changing variety; a job which quickly became and remained a hobby to be enjoyed throughout the years of one's life.

MR. J. HUNTER-RIOCH (Cambridge, and an Honorary Member of the Association) proposed the toast of the Kindred Associations. It was his first duty, he said, to convey the greetings of the Eastern Section of the Institution of Gas Engineers, and of the Eastern Junior Gas Association. He welcomed the invitation to propose the toast, because it gave him the chance of participating in the Jubilee Celebration of his first Gas Association and the opportunity to acknowledge the honour of election as Honorary Member.

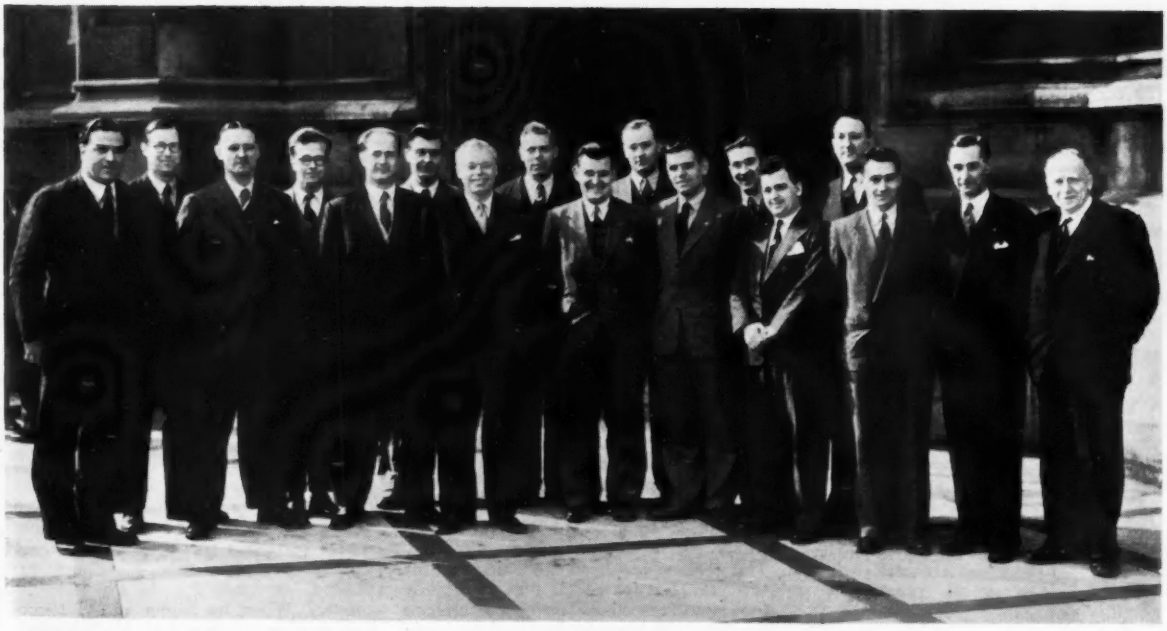
MR. JOHN FORD (President, Scottish Association of Gas Managers), in making the first reply, said that a meeting such as this took his mind back to his junior days with the Association. Its members then were imbued with the ambitions of youth; that one time of life when they were too old to accept advice. Promotion for which all strove so hard was elusive, but most had got in in time. It was to the future that juniors looked and especially to success in their jobs.

MR. L. G. TOWNSEND (President of the British Junior Gas Association Joint Council) also replied.

MR. D. N. GARRIE (Past President) proposed the toast of the guests, and SIR ANDREW CLOW (Chairman, Scottish Gas Board) responded briefly.

MR. ROBERT COWIE (Past President) proposed the toast of the Chairman, Mr. Stirling Melville. He said that in conjunction with an active Committee he had made a great success of the celebrations and richly deserved the honour of being in the chair, as for more than 25 years he had been a regular attender of the meetings. The others who made up the Committee were Messrs. Cameron, Cobb, Elgin, and Christie.

MANAGEMENT COURSE AT BROOKLANDS COLLEGE



The third Gas Council course in management and general subjects at the Brooklands County Technical College, Weybridge, ended on April 1. Our photograph shows (left to right) A. T. W. Blair (Assistant Sales Manager, Thomas De La Rue & Co., Ltd.); P. K. Marlow (Assistant to Chief Accountant, North Thames Gas Board); L. C. Coleman (Group Distribution and Sales Manager, Ipswich Division); T. B. Ferguson (Chief Assistant to Technical Manager, the Bryan Donkin Co., Ltd.); G. C. Cookson (Assistant Engineer, Swan Village, Birmingham); M. G. Gibbons (Assistant to Director, Gibbons Brothers, Ltd.); W. Robson-Brown, M.P. (Esher); M. L. Hartley (Engineer, Nottingham); E. L. Faulkner (Works Superintendent, Reading); J. Campbell (District Manager, Montrose); E. L. Eggins (Station Engineer, Cheltenham); W. S. Ingham (Works Manager, Yeadon/Guiseley District); C. J. Pope (Engineer and Manager, Abercarn); K. R. Packer (Accounting Assistant, Sussex); C. G. Partington (District Distributing Engineer, Fylde Group); A. E. C. Coltman (District Manager, Enfield); and N. A. Howell-Everson (Resident Tutor).

COMPANY MEETING

Radiation Limited

Annual General Meeting: Speech of Harold Hartley, C.B.E., D.Sc., Chairman

At the annual general meeting of Radiation Limited held at the Chartered Insurance Institute, 20, Aldermanbury, E.C.2, on Thursday, March 31, 1955, the Chairman, Dr. Harold Hartley, C.B.E., said:

The consolidated profit and loss account shows that the trading profit of the Group for the year 1954 was £1,673,284. After adding income from investments and other income and providing for depreciation, Directors' remuneration, audit fees, and pension payments, the profit before taxation was £1,439,109, an increase of £381,098 on that of the preceding year. After reserving £822,888 for taxation but crediting that account with £53,440 provided in previous years in excess of liability, there remains a net profit for the Radiation Group of £669,661.

The undistributed profits retained by the subsidiary companies amount to £353,559, leaving £316,102 as the net profit for the year for Radiation Limited. After the addition of £845 brought forward from 1953, the balance available is £316,947. The interim dividends already paid and the final dividends which are recommended for payment, will absorb £315,877, leaving a balance of £1,070 to be carried forward in the accounts of Radiation Limited.

The aggregate balance standing to the credit of the profit and loss accounts of the subsidiary companies, after including the undistributed profits, totals £1,018,134. From that amount the Directors propose to transfer £42,907, to the stocks obsolescence reserve and £300,000 to the fixed assets replacement reserve, leaving a balance of £676,297, an increase of £10,877 over 1953, which is carried forward to the consolidated balance sheet.

From the consolidated balance sheet it will be seen that the book value of the fixed assets is £2,155,672, an increase of £10,553, over the comparative figure for 1953. If the amount of £184,603, which has been written off for depreciation and the investment allowances receivable of £15,492, are added to the above increase, the resulting total £210,648 represents the net expenditure during 1954 on new building and plant.

During the year under review we have availed ourselves of the opportunity of purchasing the freehold of our Wembley works. It has been possible to do this on terms that are satisfactory to the Company.

The stocks of the Group, which comprise raw materials, work in progress and finished goods, are valued at £2,759,095, an increase of £226,201 in the year. The increase in stocks and the increase in debtors are the result of the expansion of production and sales.

During the year a number of shorter dated investments in Government stock have been replaced by others of longer date. There has been an increase this year in the investment income of £12,085; in a full year the increase will be somewhat greater. This re-arrangement of investments has released capital profits to the amount of £56,295, which have been transferred to investments reserve.

The current assets of the Group, including stocks, debtors, investments and cash, total £8,877,948, and exceed the current liabilities and provisions by £6,732,070. A year ago the excess was £6,237,349.

Trading Conditions

The cash value of sales during the year under review is a record and shows an increase of 17% over that of 1953. The sales of gas appliances are also a record, being 20% greater than in 1953.

Larger quantities of goods could have been sold had it been possible to increase production still further. We were, however, in the unsatisfactory position of having to ration our customers. It was not possible for the makers of steel sheets, suitable for enamelling, to keep pace with the increase in the demand for their products which has taken place. Reference was made to this matter in last year's address, but the position became worse in the year under review. We were able to secure considerable quantities of suitable metal from abroad, but at markedly higher prices than those ruling at home. Our experience with the Continental suppliers has been satisfactory; the metal is of good quality and deliveries have been made in accordance with the promises given.

The working of the sales organization has been effective and the demand for our products grew steadily throughout the year. The production centres are also to be commended on the way in which the output has been increased. The demand has been maintained so far this year, but the effects that will follow the new restrictions on hire purchase facilities are not yet clear. The heavy demand experienced in the past for RADIATION products derives from their quality, their price and their appeal to the public. There is every reason to expect that we shall at least maintain our share of the available business. At no time during the life of the organization have we been able to offer our customers better value for money.

During the year there have been increases in wages and in the cost of raw materials. The higher cost of steel from Continental sources is also an additional burden and it is only because we have been able to increase output appreciably that it has been possible to maintain the existing selling prices. During 1954 the quarterly demand did not show the fluctuation which characterized the previous year, and this has helped. The further increase in wages recently agreed will decrease the trading margin and it may be necessary later in the year to increase prices.

Production and Sales

As forecast last year, the 4180 low-cost cooker has been replaced by an improved type—the 4183—of all steel construction. The demand for this low-cost cooker was higher than ever. During the period of change-over output fell, but the manufacturing problems were dealt with expeditiously and by the close of the year the weekly output at the centre concerned was somewhat higher than it had ever been, and the total production for the year also was a record.

The 4183 and the 75 New World cookers are the most popular gas cookers marketed. The 75 New World is a moderately priced cooker embodying the cantilever principle in which the hotplate and oven are in effect separate units. Mounted together, the arrangement offers obvious advantages over the more conventional types of gas cookers. The output in 1954 of the 75 cooker was greater than ever. The production during the first quarter of the present year of both the 4183 and 75 cookers is in excess of that of the first quarter of 1954.

Satisfactory progress has been made also with the sales of the New World gas range—a high quality range embodying a large hotplate with griddle plate, a baking oven, a large grilling compartment, a low temperature oven and a utensil drawer. This appliance makes provision for a wider variety of cooking processes than had been envisaged previously for the domestic gas cooker. When its design and construction were undertaken it was realized that at first the demand might be restricted as neither the gas industry nor its customers had at that time experience of a domestic cooking appliance in this category. The appreciation of this range is growing steadily because of its appeal to discerning people and its sales have also played a notable part in increasing our export trade. During 1955 a new

model—the 3528—embodying improvements in details, is to be marketed.

The sale of gas space heaters was still affected by the continued application of purchase tax, but the easing of the hire-purchase regulations in July helped to stimulate the market and 40% more space heaters were sold than in the previous year.

We are the principal manufacturers of gas fires; these are designed to give both radiant and convected heat at a high operating efficiency and the progress that has been made in gas fire development owes much to the work carried out in our central research laboratories.

The prime cost of gaseous fuel is higher than that of solid fuel and it is important that the gas apparatus offered to the public shall work at a high efficiency in addition to providing the obvious convenience and cleanliness associated with the use of coal gas as a fuel. If the recommendations in the Beaver Report are accepted and the Government remove purchase tax from gas space heaters, this should lead to a further increase in demand—although for the present the position may be affected by the hire-purchase restrictions recently imposed.

There was a considerable increase in the demand for gas-operated water heaters; a direct consequence of the steps taken by the area gas boards to develop the water heating load; and we are reaping the benefit of the pioneering work done by the organization in producing gas-operated water heaters free from corrosion and scaling troubles and requiring but little maintenance. The sales of gas water heaters in 1954 showed an increase of 150% on 1953.

The sales of solid fuel appliances were not so favourable and the demand for cooking ranges, and particularly for inset fires, did not reach the levels of 1953; on the other hand, the demand for boiler flue sets for new housing reached our anticipated budgets.

The general public realize as never before something of the harm that is done to the nation by the atmospheric pollution which is a characteristic of densely populated areas in this country. The Beaver Committee has recommended that a serious endeavour be made to provide clean air over the whole of the country and has urged especially that smokeless fuels be made available for all sections of the community. The Government has given an undertaking to introduce a Clean Air Bill in this session of Parliament. The cost of coal still increases and the additional supplies of smokeless fuels necessary, when available, will be dearer than at present.

The gas industry with its smokeless fuels has done much to improve living conditions in this country and the successful implementing of the recommendations of the Beaver Committee will depend to no small extent on the ability of the gas industry to increase the production of coke. Certainly in the domestic sphere it is well equipped from the technical point of view to meet the needs of the householder. The manufacture and use of town gas is done with high efficiency and higher efficiencies are generally attained with coke and other smokeless fuels than when coal is used in the home. The supplies of smokeless solid fuels which are available, or can be made available are, however, inadequate to ensure the elimination of smoke for many years to come.

Because of the seriousness of the smoke problem our research and development sections have for years not only paid attention to the designing of suitable gas and coke-using appliances, but also of domestic apparatus in which coal can be burned with the elimination of the smoke usually emitted. Such smoke consuming coal-burning appliances were first marketed by Radiation Ltd., in 1948 for whole-house heating. When used in place of open fires burning coal, over 90% of the smoke is eliminated. These heaters give equally satisfactory results with coke.

Research and Development

In my address in 1949 there was reference to the provision of additional space for housing the central research laboratory and its staff. The rate of expansion of this section of the organization has been determined in part by the difficulty of obtaining technically trained staff and in part by the limitation of space available at the Birmingham production centre where the section is housed. Extended development facilities have been provided at the other production centres but, in addition, we have started building another research laboratory—primarily intended for background research—at our Chelsea factory.

The research work done during the past year has again covered a wide range and certain aspects were discussed in a recent paper to the Institution of Gas Engineers. New methods of heating and combustion have been studied and foundations have been laid for further advances in a number of fields covered by the Company's products. The major lines of domestic gas cookers have been improved still further as a result of recent research and development work.

The revival of interest in space heating by the gas industry has been reflected in our production of new designs of convector fires incorporating both the Rado-panel heating units and a new form of radiant. New applications of gas in the water heating field evolved during the year should lead to a reduction in the cost of installation and maintenance of this type of equipment, and assist appreciably in the work of extending the application of this high grade form of water heating.

The modernization of our large cooking equipment has continued, and our meter development section has been strengthened; a new design of meter is now passing through the necessary approval stages. Our interest in the combustion of liquid fuels has led to the marketing of an oil-fired whole-house heating unit, while in the solid fuel field the range of appliances capable of burning bituminous coal 'smokelessly' has been increased.

We have designed the Heatmaster—the name given to a new type of smoke consuming appliance for use with coke or bituminous coal. This domestic unit provides adjustable automatic cooking in the oven such as has been attainable previously only with gas or electric ovens. There is, of course, provision also for hotplate work and the unit supplies, in addition, hot water and space heating by forced convection. When used with coal over 90% of the smoke normally produced by the household is burned. This appliance is much in advance of any combination unit yet produced for use with solid fuel in the home. By arrangement with the authorities at Coventry a number have been made available there for use by the occupants of newly constructed houses.

Exports

A year ago reference was made to the adverse effect on our export trade of the continuance of import restrictions in overseas countries. During last year those affecting Australia, New Zealand and South Africa were relaxed somewhat with the result that our sales in those Dominions increased to a marked degree. Unfortunately, imports to Australia are to be restricted again from April 1.

During the last few years we have increased our activities in other parts of the world open to us; we are now exporting to some 80 different markets overseas. The result of this and of the relaxation in restrictions is reflected in our sales. These were more than 50% greater than in 1953 and are also 10% greater than in 1952—which was the previous record year for exports.

The 3518 range and the 75 and 4183 New World cookers are now widely distributed and have met with gratifying success. They are made available for use with bottled and natural gases as well as with coal gas, and this has been an important factor in enabling us to widen the basis of our trade. There has also been an appreciable increase in the export of baths and solid fuel appliances.

At the close of the year we had a substantial amount of orders in hand and arrangements have been made at the factories to deal with increased exports in 1955. The sales this year will depend, however, upon the stability of conditions overseas and in our ability to avoid price increases. Earlier this month our colleague, Mr. F. A. Hooper, reached Australia where he has gone to complete with our friends there proposals which have been under consideration for some time now for the expansion of our trade with that Dominion.

The success of the Group owes much to the spirit of co-operation and enthusiasm which exists throughout the organization, and the members of your Board are wishful that there should be an acknowledgment of the help that has been received from their colleagues.

The report and accounts were adopted, and the final dividend of 11¼% actual, less tax, on the Ordinary Stock, making 15% for the year 1954, was approved.

FAULTLESS PERFORMANCE

FLAWLESS APPEARANCE...

As the skating star's faultless performance and flawless appearance delight her critical audience, so the faultless performance and flawless appearance of the Century Cooker delight the critical housewife . . . as the star's perfect skating is the result of years of training and practice, so the Century is the result of R. & A. Main's years of experiment and research.

Always to the forefront in improving the efficiency of the gas cooker, R. & A. Main Ltd. have been "first in the field" with many outstanding features . . . in 1922 Main introduced the simplified form of cooker construction . . . in 1927 Main were first with an all-enamelled cooker . . . and in 1935 Main introduced the first all-sheet metal cooker.

The No. 20 Cooker was the first chassis-less model to be produced and marketed in Britain, and it was also the first cooker to incorporate an oven-flue vent discharging in front of the backplate. The high efficiency and popularity of the Century has indeed proved the worth of Main's years of constant research.

MAIN No. 20 CENTURY GAS COOKER

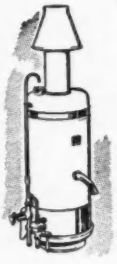
C3

Note the name-made by MAIN

R. & A. MAIN LIMITED
LONDON and FALKIRK

there is a MAIN water heater for every domestic purpose . . .

instantaneous for a complete household service . . . the M.I. Multipoint

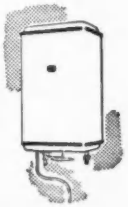


instantaneous for the bath . . . the New Junior

instantaneous or storage

for a complete household service . . . the G.L.C. Circulator

storage for a complete household service . . . the Thermain No. 15



storage for the sink or lavatory basin . . . the Thermain No. 2

MAIN WATER HEATERS Ltd.

Gothic Works, Thornton Rd. Croydon Surrey
W13

TRADE NEWS

Foxboro conductivity cells

Foxboro-Yoxall, Ltd., have recently added to their range two conductivity cells known as the models 'GC' and 'GB' which embody a number of new features designed to give improved conductivity measurement when used in conjunction with the Foxboro electronic 'Dynalog.' This instrument is said to be notable among industrial conductivity measuring instruments by reason of its 1,000 cycle measuring circuit which has the effect of practically eliminating the incidence of polarization.

Polarization, an electro-chemical effect, results in a reverse, or back E.M.F. and consequent error in measurement. This

Two examples of the new Foxboro conductivity cells, above type 'GC' and below type 'GB.'

effect is at its worst with a direct current, but with an alternating current the effect is inversely proportional to the frequency, so that at 1,000 cycles a sustained accuracy of measurement is obtained.

The new cells are of the insertion type for mounting in a pipeline or the side of a tank. The type 'GC' is designed with an assembly including an integrally mounted gate valve and fittings so that the cell may be removed for inspection and cleaning without interrupting the flow of the process. The type 'GB' is similar in design, but is not equipped with the valve. Both cells will screw into a standard 1¼ in. pipe. The 'GC' and 'GB' cells are each made in constants of 1.0, 0.1 and 0.01, and employ carbon electrodes instead of the more familiar metallic type which has always had an unsatisfactory feature in that it requires platinizing before and during service. If it is left with a smooth surface polarization will occur, so the surface has to be roughened by coating the electrode with platinum black. In service this coating wears off and the cells must be periodically withdrawn for replatinizing. The new Foxboro carbon electrodes have the same surface properties with regard to polarization as the platinized metallic electrode, but they are claimed to have the advantage of needing no initial or subsequent platinizing. The new cells have been designed for easy dismantling with the carbon electrodes quickly accessible for simple periodic cleaning.

The body of the cell is of robust construction and the design ensures an absolutely leakproof seal, even under high pressures, where the cable enters the cell. The new cells are normally supplied in stainless steel and are designed to operate at temperatures up to 220°F. and pressures up to 150 per sq. in. If it is necessary to operate at higher temperatures or pressures, or in the presence of fluids liable to attack stainless steel, specially adapted cells are available according to the requirements of the particular application.—*Foxboro-Yoxall, Ltd., Lombard Road, Merton, S.W.19.*

Vibration measuring equipment

Measurement of the vibration velocities and amplitudes is essential to the successful balancing of large rotating parts, such as the rotors of turbo-alternators. In many cases this measurement and subsequent balancing up must, as in the example cited, be undertaken while the components are rotating at speeds of the order of 3,000 revolutions per minute. In order to facilitate such vibration measurement and balancing, the British Thomson-Houston Company has developed a portable electronic vibration measuring equipment which is capable of measuring vibration velocities down to 0.005 in. per second, and vibration amplitude down to 0.00005 in. (peak to peak). The equipment, which consists of a measuring amplifier, a dynamometer and a reference generator together with the ancillary pick-up units, is said to be capable of measuring the relative phase of the vibration to an overall accuracy of approximately plus or minus 2%.—*British Thomson-Houston Company, Ltd., Rugby.*

Grinding machine developments

Two new grinding machines—the portable electric high speed heavy duty angle grinders types 'AG7' and 'AG9'—have involved the design of a new universal type motor which is continuously rated at 1.5 b.h.p. Only thus, say the makers, is it possible to provide the 8,000 r.p.m. and 6,000 r.p.m. for the 7 in. and 9 in. diameter discs respectively, which are the requisite operating speeds for obtaining maximum performance and disc life. These angle grinders are said to possess ample reserves to maintain the correct speeds and power under prolonged and rigorous heavy production conditions. Grinding is done with the edge of the disc and both the "AG7' and 'AG9' grinders accommodate discs from $\frac{5}{16}$ in. to ¼ in. thick, but those supplied as standard equipment are ¼ in. thick, the others being available as accessories. The ¼ in. disc is stated to suit all general requirements in steel, iron and non-ferrous metals.

Specially-designed high speed backing pads with a wide range of silicon carbide and aluminous oxide fibre backed sanding discs are also available as accessories.

The new motor incorporates armatures, dynamically balanced to 'precision limits'; ball-bearings of double-

Heavy weld dressing with 9 in. heavy duty high speed angle grinder (type 'AG9').

sealed type which retain grease and exclude dust, inserted in steel liners integral with castings; gears and spindles mounted on ball and needle roller bearings; and insulated commutator and brush gear, completely sealed from motor ventilation flow.—*Wolf Electric Tools, Ltd., Hanger Lane, London, W.5.*

Cold bending machine

An addition to the range of hydraulic cold bending machines manufactured by Finlay Engineering, Ltd., is the model 'RG100' which was specially designed to meet the requirements of structural engineering firms in Canada.

In its basic construction, the 'RG100' consists of a press unit comprising a horizontal ram and cylinder, pump assembly and power drive, mounted on a fabricated bedplate designed with a gap to accommodate joists 24 in. deep. The ram cylinder is cast in high tensile, close-grained iron and is machined to take the ram, control valve, safety valve and pump assembly. The ram head is designed so that a variety of fittings can be adapted for carrying out a wide range of work.

The ram movement is controlled by a hand-operated lever and operates the pressure control valve by rotating a cam. A light oil is used as the pressure medium and also as a lubricant for the pump drive which is all enclosed in a cistern spigotted to the rear end of the cylinder. Two plunger pump units are operated by a two-throw cam shaft through tappet levers, this shaft being

carried on ball and roller bearings and all wearing surfaces of the equipment are of hardened steel.

The 5 H.P. electric motor is mounted on top of the cylinder and is connected to the pump drive shaft by a 'V' rope drive enclosed in a white metal guard. This machine can be used as a portable unit.

Besides dealing with joists up to 24 in. × 7½ in. section, the 'RG100' can be supplied with standard flanging attachment which will allow cold bending of all kinds of flanges and rings to a fair degree of accuracy.—*Finlay Engineering, Ltd., Newport, Mon.*

'Jizer' solvent

Stated to be non-acid, non-fuming, non-caustic and harmless to the skin, 'Jizer' degreaser will take up many times its own volume of grease and oil and yet still remain soluble in water. It can be used for cleaning engines and their various components, oil storage tanks, workshop floors, and tools.

To clean articles, 'Jizer' should be brushed on and then rinsed off with water; small items can be immersed in the solvent and then rinsed. It is stated that after rinsing, a fine film is left on the surface of the article which will prevent the formation of rust.—*Deb Chemical Proprietaries, Ltd., Belper, Derbyshire.*

Safety taps design

Much stress is being placed in the gas industry, on the importance of the fitting of taps to domestic gas appliances which cannot be turned on accidentally and which, in addition, give visual indication when the gas is on. This, to protect elderly people and children from the effects of accidental coal gas poisoning.

The Vulcan Stove Co., Ltd., have produced a new tap which is incorporated on the 'Devon Royal' cooker, in which conditions of safety are claimed to be fully met.

The taps are flush fitting beneath the grill cornice, and each presents a flat face in either the 'on' or 'off' positions. When 'off,' the operating face is beneath the grill cornice parallel with the loose crown tray and is locked in this position. To turn 'on,' one pushes this face upwards, which releases the lock, and then rotates the face towards one until, when full on, the face is parallel with the front of the cooker. The face then presented is coloured red, and this colour is visible at all gas rates until the tap is fully 'off.'

The finish of the operating faces is of anodised aluminium, which allows the incorporation of a permanent red dye in the anodic coating itself, ensuring, it is stated, that this colour will be permanent.

The face presented when the taps are 'off' is of natural anodised aluminium.

An arrest position is provided at the lowest stable gas rate, thus immediately locating the simmering position for each burner.—*The Vulcan Stove Co., Ltd., Exeter.*

'Terylene'

Understood to be under consideration for use as submerged conveyor-belting, 'Terylene'—the recent fibre development—is said to have exceptionally low absorbency. This results in little change in its weight and strength when wet and also means that the fibre dries quickly. In addition the fibre does not swell when immersed in water.

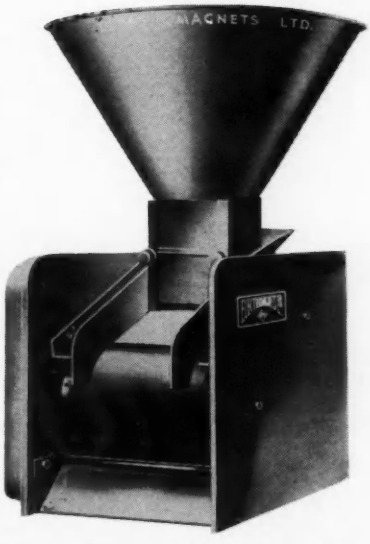
Also claimed for 'Terylene' is a heat resistance 'superior to that of all other industrial textiles with the exception of glass and asbestos.' When 'Terylene' is exposed to air at 150°C. for 1,000 hours, it is said that its loss of strength is only 50% and it withstands temperatures up to 200°C. for shorter periods.

Other advantages attributed to 'Terylene' are: Resistance to most acids and oxidizing agents and an adequate resistance to alkalis; great strength and with little extension; high resistance to rubbing or abrasion, with the ability to withstand considerable flexing; rot resistance; and good electrical properties, making it suitable as an insulation medium.

The makers say: 'The important advantages of low stretch and high flex resistance which are offered by 'Terylene' may prove to be of great value to manufacturers of tyres and belting fabrics and extensive trials are now in hand to test the performance of the fibre in these fields.'—*Imperial Chemical Industries, Ltd., 'Terylene' Council, Hookstone Road, Harrogate, Yorkshire.*

Magnetic conveyor head unit

The photograph shows the 'Boxmag' patent magnetic conveyor head unit in permanent magnetic form built into a shortband conveyor. Although the 'Alcomax' permanent magnetic head has a diameter of only 6 in. it is claimed



to possess a superior performance to a 14 in. diameter magnetic pulley or drum. It is further claimed that the patented magnetic conveyor head system is the only one which develops two to three times the intensity of a pulley or drum of equal diameter. This conveyor head is not a drum or a pulley, but a new development representing an advance in tramp iron separation, say the makers.

Large electrically energized conveyor head units are available for handling the highest tonnage of materials.—*Electromagnets, Ltd., Boxmag Works, Bond Street, Birmingham, 19.*

Diary

April 9.—SCOTTISH JUNIORS (WESTERN DISTRICT): President's Day visit to Perth Gasworks.

April 14.—WALES AND MON. JUNIORS (SOUTH): Annual General Meeting. Porthcawl.

April 16.—SCOTTISH JUNIORS (EASTERN): Visit to the Dunkeld undertaking. Combined paper.

April 16.—LONDON JUNIORS: Visit to Kensal Green Works of the North Thames Gas Board, 2.15 p.m.

April 16.—YORKSHIRE JUNIORS: Address by L. W. Andrew, Director, Watson House. Leeds University.

April 19.—LONDON AND SOUTHERN SECTION, I.G.E.: 'Large Scale Carrier Gas Carbonization,' A. F. Grant and C. H. Lewis. Bishop Partridge Hall, Church House, Great Smith Street, Westminster. 2.30 p.m.

April 19.—MIDLAND JUNIORS: 'Purification,' F. Grocott. Staff Mess Room, Birmingham, 6.30 p.m.

April 20.—COKE OVEN MANAGERS' ASSOCIATION: 'Experiences in the Operation of a Collin De-Sulphurizing Plant,' T. H. Williams, Royal Victoria Station Hotel, Sheffield, 7 p.m.

April 22.—MIDLAND SECTION, I.G.E.: Annual General Meeting. Queen's Hotel, Birmingham, 2.30 p.m.

April 26.—INSTITUTION OF CHEMICAL ENGINEERS: 33rd Annual Corporate Meeting, May Fair Hotel, London, 11 a.m.; Annual Dinner, 7.30 p.m.; principal guest, the Duke of Edinburgh.

April 26.—MIDLAND JUNIORS: Annual General Meeting. 'Works Locomotive Tyres,' G. E. Palmer. Birmingham.

April 27.—MANCHESTER JUNIORS: Annual Dinner, Lonyford Hall, Stretford.

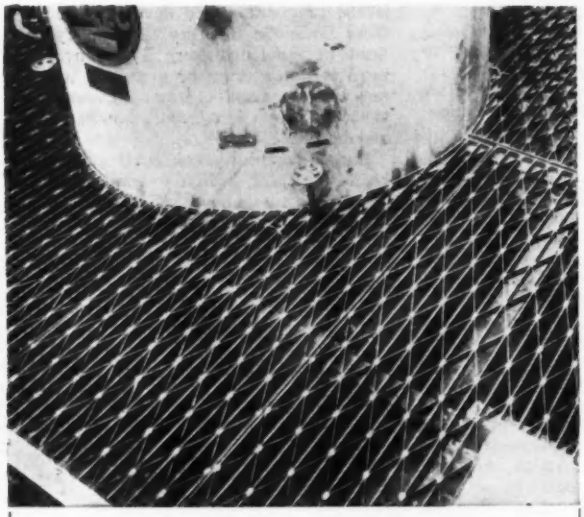
April 27.—NATIONAL BENZOLE AND ALLIED PRODUCTS ASSOCIATION: Annual General Meeting. Grosvenor Hotel, Victoria, London, S.W.1, 2 p.m.

April 28.—NORTH THAMES G.C.C.: Caxton Hall, Westminster, 2.30 p.m.

April 29.—LONDON JUNIORS: 'Subjective Response and Environment,' F. C. Smith. 178, Edgware Road, London, W.2. 6.30 p.m.

April 30.—WESTERN JUNIORS: Annual General Meeting and visit to works. Weston-Super-Mare.

May 3.—EAST MIDLANDS G.C.C.: George Hotel, Grantham, 11.30 a.m.



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BIG Capacity for LITTLE Kitchens

Especially suited to the kitchens of flats and small houses, this highly efficient cooker provides utmost cooking capacity in the least possible space. Cast iron construction ensures strength and durability and reduces maintenance costs to a minimum, thus making the Dainty Minor particularly suitable for simple hire or hire purchase.

Approved and adopted by leading gas boards

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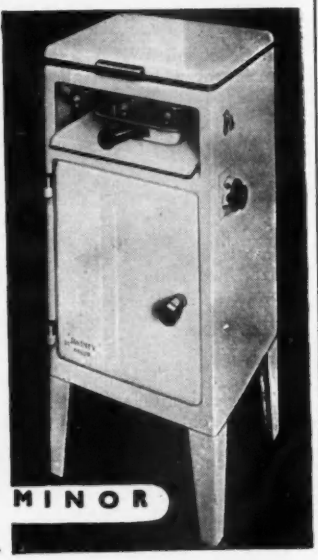

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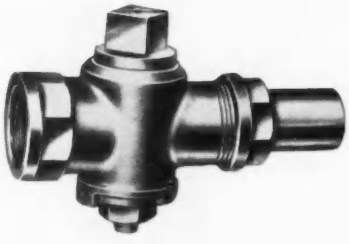
WHEN THINKING OF BRASS GAS FITTINGS
THINK OF
TAYLOR BROTHERS

MAIN COCKS HOT PRESSED OR CAST



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LARGE RANGE OF STANDARD FITTINGS

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Wellman-Galusha Gas Producers

A battery of seven 10′ 0″ diameter Wellman-Galusha Gas Producers, for gasifying Natal anthracite coal—under construction at Vereeniging, Transvaal, South Africa. The entire installation is one of the most extensive gas producer plants to be erected initially as one battery in the British Commonwealth.

Wellman-Galusha Gas Producers can be supplied in 6′ 0″, 8′ 0″ or 10′ 0″ diameters and will produce an ideal gas for all industrial purposes.

THE WELLMAN SMITH OWEN ENGINEERING CORPN. LTD.
PARNELI HOUSE, WILTON ROAD, LONDON, S.W.1 WORKS: DARLASTON, SOUTH STAFFS.

TURBO-COMPRESSORS & EXHAUSTERS FOR AIR AND GAS

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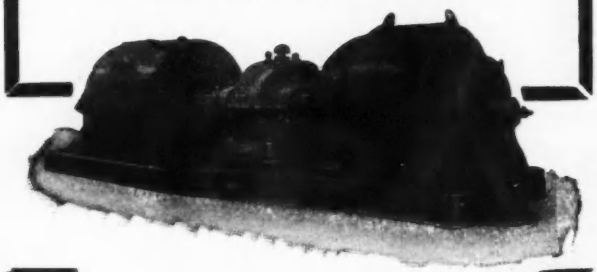
We build a complete range of Compressors & Exhausters for air and GAS, suitable for all purposes connected with the GAS industry, including Turbo-Compressors for large capacities, as illustrated below



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5,400 lbs per sq. in. . . . that's the sort of pressure a Wade Coupling stood up to before it gracefully surrendered. And this test was carried out by David Kirkaldy & Son at their testing and Experimenting Works.
Of course, these extreme pressures are not normal, but a Wade Coupling does give an extraordinary margin of safety. It's gasproof and leakproof, and all sizes and types are made for copper, steel or bundy tubing.

WADE couplings

Rubber Hose Nozzle Type F101. ¼" and ½" B.S.P. Male, ex type F101A. ¼" O.D. Pipe.

If you've never handled a Wade Coupling, make a FREE TEST. We'll send you any size or type.

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See "Gas Journal," Sept. 22, 1954, P.706

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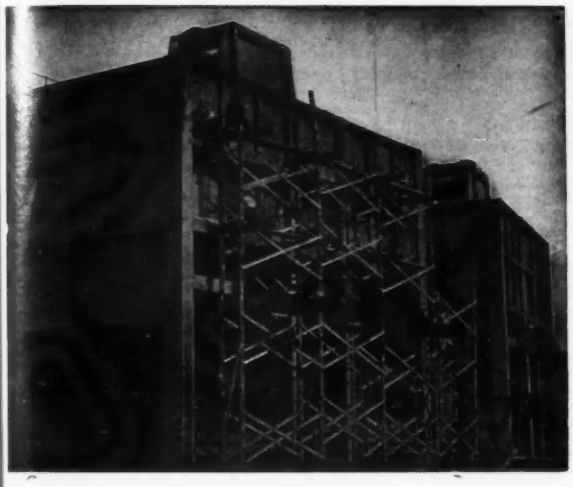
Gunite



One of the reinforced concrete structures reconditioned with Gunite for the City of Carlisle Gas Undertaking.

Gunite—concrete applied by air pressure—has numerous applications where its great density and extreme adhesion have exceptional value.

For repairing reinforced concrete it has particular merit, as, due to the method of application, a uniform density and adherence is obtained whenever Gunite is applied.

For lining coal bunkers and steel chimneys it possesses great resistance to corrosion and protects steel-work from the abrasive action of coal or coke.

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When high thermal shock resistance counts . . .

Vitreosil has an extremely low co-efficient of expansion and is free from fracture due to rapid changes in temperature. The high working temperature of 1000°C. and homogeneous surface makes it the ideal material for laboratory analysis, or combustion experiments where high purity is essential. A comprehensive range of laboratory pieces and special analysis equipment is available.

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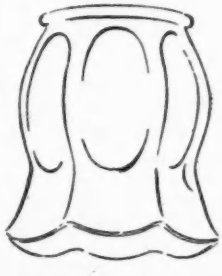
The attractive translucent finish of a Vitreosil gas globe is ideal for diffused lighting. A standard range of gas globe fittings is always available for prompt delivery.



THE THERMAL SYNDICATE LIMITED
WALLSEND · NORTHUMBERLAND
Telephone: Wallsend 63242
London Office: 12-14 Old Pye Street, Westminster, S.W.1

WALTER KING SERVICES

PERIODICALS . . .

GAS JOURNAL. *(Weekly.* Wednesday, By Post, **1s. 5d.)**

The "Gas Journal" has existed as an integral part of the Gas Industry since 1849. Unbiased policy, technical knowledge, accuracy and reliability combine with an extensive news service and modern make-up to make the Journal the leading Gas Industry newspaper.

Annual Subscription (including a copy of the "Gas Journal" Calendar and Directory): Home and Empire, **52s.** ; Foreign, **60s.**

GAS SERVICE. *(Monthly.* By Post, **1s. 2d.)**

"Gas Service" is the specialist magazine for the Sales and Service personnel of the Industry. It covers all aspects of gas service from the holder to the burner. In addition to sound editorials, news items and specially contributed articles, "Gas Service" also reports in the fullest possible manner the activities of the numerous Salesmen's Circles.

Annual Subscription : Home and Empire, **12s.** ; Foreign, **15s.**

BOOKS and ANNUALS . . .

Some current works covering the manufacture, distribution, and sale of gas are :—

KING'S MANUAL OF GAS MANUFACTURE. Now being issued in 10 self-contained sections. Sections available and prices on application.

MANUAL OF GAS FITTING. By R. N. Le Fevre. **30s.**

GAS DISTRIBUTION ENGINEERING. By R. N. Le Fevre **22s. 6d.**

DOMESTIC UTILIZATION OF GAS. By Smith & Le Fevre **20s.**

High Pressure Gas Main Construction (Restall), **10s. 6d.**

ANNUALS:—

"Gas Journal" Calendar and Directory, 25s. ; "Gas Service" Pocket Book (1954 Edition) **5s.**

BINDING . . .

In addition to permanently binding subscribers' journals, (particulars and prices for which we shall be pleased to give on application) we can supply TEMPORARY BINDERS for the Gas Journal, Gas Service and King's Manual of Gas Manufacture, thus enabling readers to *bind their copies as received.* The danger of mislaid or damaged copies is eliminated.

Gas Journal temporary binder
Gas Service " } . . . . **13s. 3d.** each inc. postage.
King's Manual " . . . . . **9s. 9d.** each inc. postage.

PHOTOGRAPHY . . .

Walter King Photographs specialize in Gas Industry photography of every description—work in progress series, plant, appliances, showroom displays, exhibition stands, social and educational visits of all kinds. Tours for various areas of the country can be arranged. First class photography at competitive rates. Full particulars on application.

WALTER KING LTD., 11 BOLT COURT, FLEET STREET, LONDON, E.C.4

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APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18–64 inclusive or a woman aged 18–59 inclusive unless he or she, or the employment, is exempted from the provisions of the Notification of Vacancies Order, 1952.

EDITORIAL ASSISTANT required by publishers of *Gas Journal* and *Gas Service*. Applicants should be 22-25 years of age, and should combine writing ability with some knowledge of the technical aspects of the Gas Industry. This is a progressive position for a man of adaptability and initiative. Applications, which will be treated confidentially, should be made in writing to the Managing Director, Walter King Ltd., 11, Bolt Court, Fleet Street, London, E.C.4, giving details of qualifications, experience and salary required.

INDUSTRIAL MAINTENANCE ENGINEER required for Natural Gas undertaking in WEST PAKISTAN. Applicants must have practical experience in the construction, operation, etc., of all types of Industrial and Commercial plant where gas and other forms of fuel are utilised and should be capable of carrying out adjustment and maintenance of burners and controls and of supervising and training native fitters. Attractive salary, 3 year contract and other benefits. Write with details of qualifications and experience to Box G.J.219, c/o 191, Gresham House, E.C.2.

CITY OF BELFAST
GAS DEPARTMENT
APPOINTMENT OF CHIEF ENGINEERING ASSISTANT AND TECHNICAL ASSISTANT

APPLICATIONS are invited for the following positions:—

CHIEF ENGINEERING ASSISTANT:

Candidates must not be over 45 years of age on June 1, 1955.

The Chief Engineering Assistant will be responsible for the design and preparation of Specifications for Civil Engineering and other projects and for the execution of such work. A knowledge and experience of general Gas Works practice and of the design and layout of Gas Works plant is desirable. Experience in carrying out similar work is essential and a University Degree in Engineering or Membership of the Institution of Civil Engineers or other equivalent qualifications will be required.

The Salary scale is £1,000 × £50—£1,250. A commencing salary higher than the minimum of the scale may be paid in the case of a candidate with exceptional qualifications and experience.

TECHNICAL ASSISTANT:

Candidates must not be over 35 years of age on June 1, 1955.

An engineering training, a sound technical education, and a knowledge of Elementary Chemistry are essential.

The salary scale is £500 × £25—£650. A commencing salary higher than the minimum of the scale may be paid in the case of a candidate having knowledge and experience of Gas Manufacture or other special qualifications.

Superannuation contributions will be payable at the rate of approximately 6 per cent. of remuneration. Canvassing in any form will disqualify.

Application Forms, etc., are obtainable from the Engineer & Manager, Gas Works, Ormeau Road, Belfast, and completed applications, with copies of three recent testimonials, must reach the undersigned not later than 4 p.m. on Thursday April 28, 1955.

JOHN DUNLOP,
Town Clerk.

P.O. Box No. 234,
City Hall, Belfast.
April, 1955.

NORTH EASTERN GAS BOARD
WAKEFIELD GROUP
TECHNICAL ASSISTANT (DISTRIBUTION)

APPLICATIONS are invited for the above position at a salary within Grade A.P.T.5 (Provincial "A") (£500-£580 per annum) of the Salary Scales agreed by the National Joint Council for Gas Staffs.

Duties mainly concerned with installations on domestic premises under the supervision of the Group Sales Manager.

Applicants should hold the Ordinary Grade Certificate in Gas Supply of the Institution of Gas Engineers or its equivalent.

The successful applicant will be required to pass a medical examination and to participate in the Board's Staff Pension Scheme.

Applications, stating age, training and experience, should reach the Group General Manager, Warrengate, Wakefield, by Tuesday, April 19, 1955.

J. C. GARDNER,
Secretary.

Bridge Street,
Leeds 2.

SOUTH EASTERN GAS BOARD
GAS ENGINEERING DRAUGHTSMAN,
ROCHESTER
KENT COUNTY DIVISION

CANDIDATES must have had drawing office experience of structural steel work and steel and cast iron pipe work and be capable of preparing detailed working drawings.

Salary within Grade 6 (Prov. "A") £530-£610 p.a.

Applications in writing, quoting reference V10/535 and giving full details, should reach the undersigned within fourteen days.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SALES AND SERVICE ENGINEER required for Natural Gas undertaking in WEST PAKISTAN. Applicants must be qualified Industrial Gas Engineers and have full knowledge of the utilisation of gas and other fuels in Industrial and Commercial establishments together with wide experience of the design, development and operation of Industrial and Commercial gas burner equipment including controls. Attractive salary, 3 year contract and other benefits. Write with details of qualifications and experience to Box G.J.218, c/o 191, Gresham House, E.C.2.

Classified Advertisements Continued on page 70.

PUBLISHERS' NOTICE

The "Gas Journal" is published every Wednesday, price **1/3d.**; by post **1/5d.**

Subscription Rates: Home and Empire:—**52/-** per annum; Foreign:—**60/-** per annum. (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at **2/-** per line (approx. **7** words)—minimum charge **10/-**. A Box Number address occupies **2** lines, and a further **6d.** is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received **14** days prior to publication if proofs are required. Type area of inside pages **10** in. deep × **7** in. wide; block screen **120.**

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS MANAGER: G. B. Torrance, 42, Wychall Lane, King's Norton, Birmingham, 30. *Telephone:* Kings Norton 3868

NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

SOUTHERN REPRESENTATIVE: A. Engelhardt, 11, Bolt Court, Fleet Street, E.C.4. *Telephone:* Central 2236-7

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. *Telegrams:* Gasking, Fleet, London.

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Gas Bags for Repairing Mains

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Impervious to Main Liquor and Climatic Influences.

Pull-through and Expanding MAIN STOPPERS.

All types of INDIA-RUBBER BOOTS.

DRAIN RODS AND WHALE-BONE BRUSHES.

HOSE AND TUBING FOR ALL PURPOSES.

Round or Cylinder Shape.

Stokers' Mitts and Gloves of every description.

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Blue pressed and Wirecut Paviors for Hopper Linings and Retort House Floors

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Driving and Conveyor Chains of the best quality; made of Ley's Celebrated Blackheart Malleable Iron.
ALSO COMPLETE CONVEYORS AND ELEVATORS

APPOINTMENTS VACANT (ctd.)

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON AND DISTRICT DIVISION
MAINS INSPECTOR,
WOLVERHAMPTON DISTRICT

CANDIDATES must have a knowledge of all aspects of mainlaying, including testing requirements.

The salary will be within Grade 6 (£530-£610 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to Mr. Stanley Jones, Divisional General Manager, West Midlands Gas Board, Gas Offices, Kensington House, Bath Street, Dudley, to reach him within fifteen days of the appearance of this advertisement.

J. C. INGRAM,
Secretary to the Board.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
SHOWROOM ASSISTANT—ALFORD

APPLICATIONS are invited for the above post. The person appointed will be responsible to the District Superintendent at Mablethorpe for sales and consumer service in the small town of Alford.

The commencing salary will be within grade APT 3 of the (Provincial 'B') National Salary Scale for Gas Staffs (£320/£490). The post is pensionable and the successful candidate will be required to pass a medical examination. A house is available under a service occupation agreement at a reasonable weekly payment.

Applications, stating age, and giving details of education, qualifications and experience together with the names of two referees should be addressed to the Group Manager, East Midlands Gas Board, Skegness, to arrive not later than April 14, 1955.

BERNARD CLARKE,
Divisional General Manager.

Lincoln.
March 25, 1955.

EAST MIDLANDS GAS BOARD

SHEFFIELD AND ROTHERHAM DIVISION
ENGINEER—No. 6 DISTRICT

APPLICATIONS are invited for the above position from qualified persons who possess the Higher Grade Engineering (Manufacture) Certificate of the Institution of Gas Engineers. Candidates should have experience of machine-charged horizontal retorts, carburetted water gas plant and general works practice. The Engineer will be directly responsible to the Divisional Engineer for the operation of the East Retford and other small neighbouring works.

The salary will be within Grade A.P.T. 10 (Provincial 'A') of the National Salary Scales (£715/815 per annum). Housing accommodation will be made available at a reasonable rent.

The post is superannuable, and the successful candidate may be required to undergo a medical examination.

Applications giving details of qualifications and experience, together with the names of two referees, should be addressed to the undersigned not later than April 23, 1955.

C. C. WOOD,
Divisional General Manager.

Gas Offices,
Commercial Street,
Sheffield, 1.
March 28, 1955.

SOUTHERN GAS BOARD

EASTERN DIVISION
PORTSMOUTH, GOSPORT AND BOGNOR-REGIS GAS UNDERTAKING
CHEMIST

APPLICATIONS are invited to fill two vacancies on the Chemical Staff of this Undertaking.

Candidates must have had experience of modern gas works plant and processes and be familiar with all routine laboratory tests.

Heavy Oil Catalytic Gasification Plant and Tray Purifiers are now being installed.

The commencing salary will be within Grades APT V and VI £500-£610 per annum on an appropriate step according to experience.

Accommodation is available at a moderate rental if required, and the successful candidates will be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme.

Applications stating age, experience and qualifications, giving the names of two Referees, should be received by the undersigned not later than the first post on April 16, 1955.

H. M. LAWRENCE,
Engineer & General Manager.

Gas Offices,
The Square,
Portsmouth.
March 21, 1955.

SOUTHERN GAS BOARD

INDUSTRIAL GAS OFFICER

APPLICATIONS are invited for the appointment of INDUSTRIAL GAS OFFICER in the Commercial Manager's Department of the Board at a commencing salary in the region of £1,500 per annum according to qualifications and experience.

Applicants should have had experience in the design and installation of industrial plant for a range of industries, and should be able to develop the use of gas for industrial purposes throughout the Board's Area. The work will include contacting industrialists and carrying out surveys, etc.

The successful candidate will be required to pass a medical examination and, unless already subject to a pension scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required to join the Board's Staff Pension Scheme.

Applications stating age, education, qualifications, training, experience, present appointment and salary, together with a one-page summary of these particulars, should be sent in an envelope marked "Industrial Gas Officer" to the Secretary, Southern Gas Board, 164, Above Bar, Southampton, to reach him not later than April 30, 1955.

CHEMIST, in Manchester area, for research and routine work. Experience with coal tar products and synthetic resins desirable. State age, experience, qualifications, salary, etc., to No. 234, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

DRAUGHTSMEN required, experienced in Gas and Chemical Engineering. Pension Scheme. Five day Week. Canteen facilities. Apply W. C. Holmes & Co., Ltd., P.O. Box B.7, Huddersfield.

HARDMAN & HOLDEN LIMITED requ're Research Chemist for work on gas purification problems. Age 30-40. Research experience necessary. Salary in accordance with experience and qualifications. Pension and Insurance schemes in operation. Apply Chief Chemist, Manox House, Coleshill Street, Miles Platting, Manchester, 10.

NORTH WESTERN GAS BOARD

APPLICATIONS are invited for the following pensionable appointments:—

NORTHERN GROUP
DISTRICT SERVICE MANAGER,
LANCASTER/MORECAMBE DISTRICT

Commencing salary £1,050 per annum.

The person appointed will be responsible for all aspects of consumer service within the above district including the organisation of gas installation and servicing staffs, the control of showrooms and general administrative co-ordination.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B. (Northern Group), St. George's Quay, Lancaster, within 14 days.

EAST LANCASHIRE GROUP
SALESMAN-IN-CHARGE NELSON DISTRICT SHOWROOMS

The salary will be within Grade A.P.T. 5 (£500/£580 per annum).

The successful applicant will be responsible to the District Service Manager for all showroom activities in the Nelson District. Previous showroom and sales experience are essential, and preference will be given to applicants holding a certificate in Gas Salesmanship and Consumer Service.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B. (East Lancashire Group), Gas Offices, Cardwell Place, Blackburn, within 14 days.

EDUCATIONAL

THE UNIVERSITY OF LEEDS

DEPARTMENT OF COAL GAS AND FUEL INDUSTRIES WITH METALLURGY AND CHEMICAL ENGINEERING

APPLICATIONS are invited from graduates well qualified in pure or applied science for:—

The Smith-K.L.G. Research Scholarship for work on ceramic materials, particularly refractory oxides;

The Gas Research Fellowship provided by the Institution of Gas Engineers for research in gas chemistry; and

Two posts of Research Assistant to the Joint Research Committee of the Gas Council and the University.

Industrial experience will be an advantage but is not essential. The emoluments range from £325-£600 a year, and further particulars in each case may be obtained from the Registrar, The University, Leeds, 2, and detailed applications, giving date of birth, qualifications and experience and the names of three referees, should reach the Head of the Department of Coal Gas and Fuel Industries, The University, Leeds, 2, not later than May 7, 1955.

PATENTS

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For resale to the public, and in bulk for works use.
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SOUTH WESTERN GAS BOARD

THE following charging/discharging machines are available for sale due to the recent closure of the two Works shown:—

AT TEIGNMOUTH

Jenkins de Brouwer, suitable for retorts up to 6 ft. 4 in. centre above rail level and a through length of 15 ft., all electric D.C., 3-ton coal hopper.

AT NEWTON ABBOT

Guest-Gibbons, suitable for retorts up to 6 ft. 6 in. centre above rail level and a through length of 15 ft., all electric D.C., 30 cwt. coal hopper, a considerable number of suitable spares including three motors, etc.

For further information, appointments to view and offers, please communicate with the undersigned.—

H. G. STAPLEY,

South Western Gas Board,
Hollacombe,
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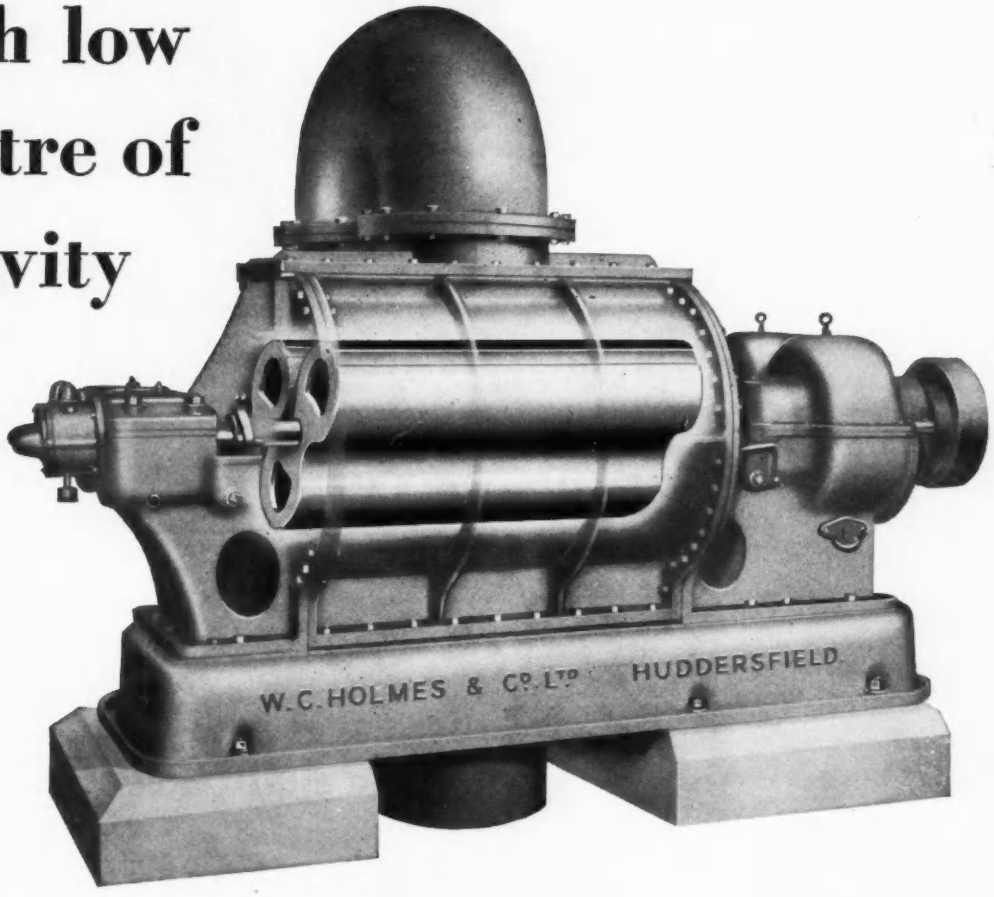
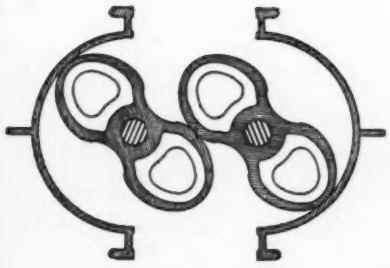
MAXIMUM STABILITY

with low centre of gravity



maximum stability



and efficiency are assured in the re-designed Holmes-Connersville exhauster. The upward gas delivery results in the downward thrust being carried the shortest distance to the bedplate. The gas inlet is conveniently arranged under the machine with outlet on top permitting easy internal inspection.

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BECAUSE within the operational range of these units no other fan compares for price, design simplicity and economy of space. Bifurcated fans are direct driven units which will handle obnoxious fumes and gases up to 350° F. Their easily accessible K.B. made, totally enclosed and weatherproof motors are completely isolated from the fumes or gases handled.
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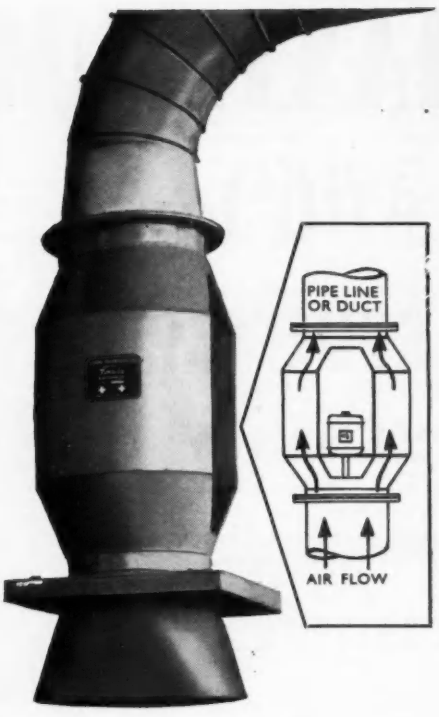

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Railway and Civil Engineering Contractors
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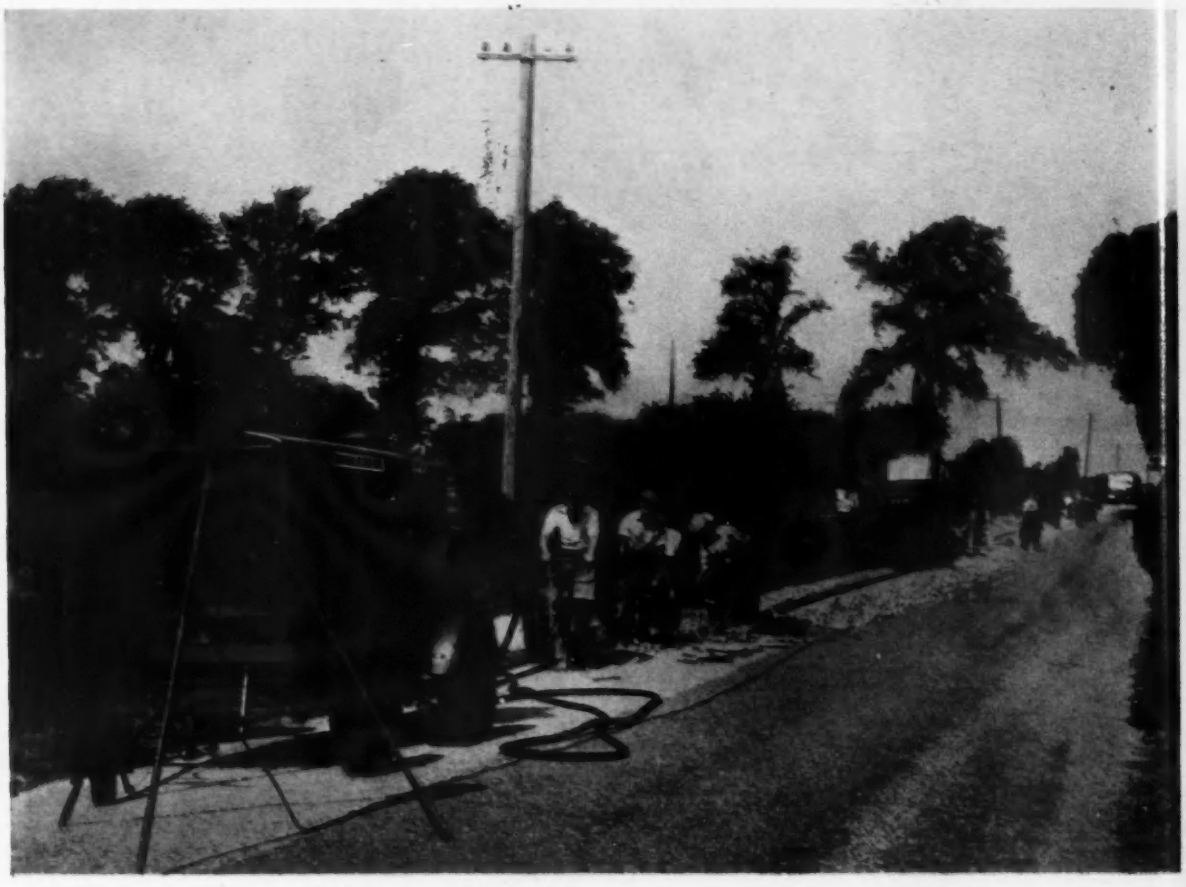

Photograph by courtesy of Messrs. C.D.L. Construction Co., Ltd.

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This "BROOMWADE" compressor is teamed with "BROOMWADE" RB.55 road breakers to cut a trench in a granite-surfaced road near Launceston.
"BROOMWADE" compressors and tools have a deservedly high reputation throughout the world for efficiency and reliability — even under the most adverse conditions.

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